BERN
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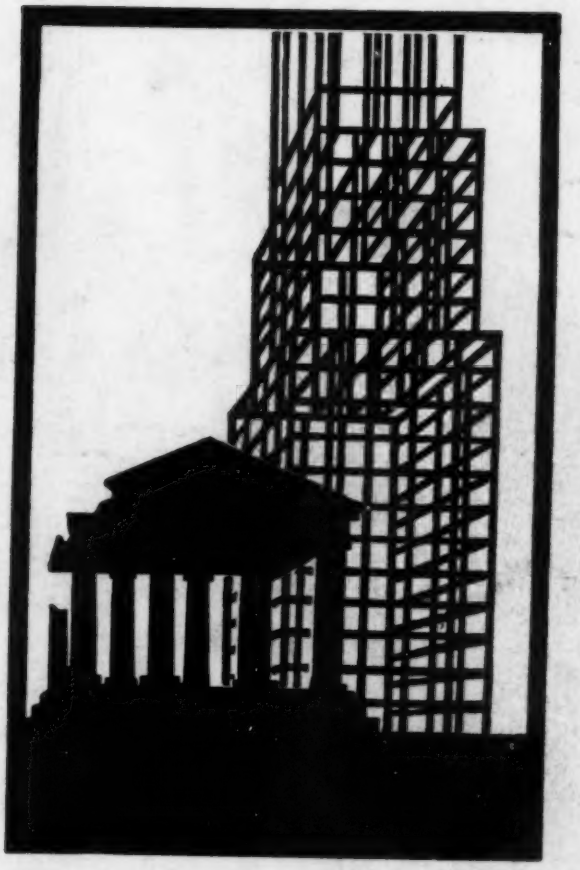
DEC 9 1930

THE ARCHITECTURAL RECORD



DECEMBER 1930

Residence of John Bayer, La Crosse, Wis. Otto A. Merman, architect; Mike Nowak & Sons, plastering contractors, both of La Crosse.

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THE ARCHITECTURAL RECORD

Published Monthly by F. W. Dodge Corporation, 115–119 W. 40th St., New York

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VOLUME 68 DECEMBER, 1930 NUMBER 6

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Parker Morse Hooper, *Consulting and Contributing Editor*

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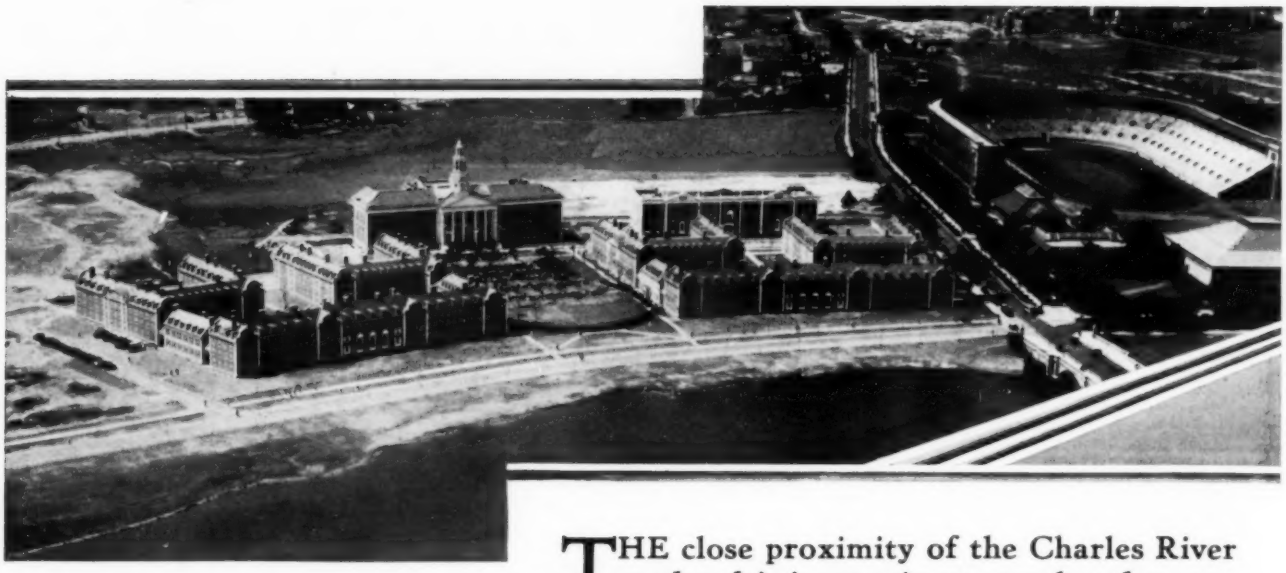
LEADING ARCHITECTS PREFER TRUSCON PROTECTION



Harvard University School of Business Administration. McKim, Mead & White, Architects. Hegeman-Harris Company, Contractor. Over twelve tons of Truscon Waterproofing Paste used to waterproof the foundations.

Waterproofings - Dampproofings
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THE close proximity of the Charles River rendered it imperative to employ the most effective waterproofing known for the foundations of the Harvard University School of Business Administration. As usual when fine buildings and difficult conditions demand certainty of waterproofing results, Truscon Waterproofing Paste Concentrated was the protective material selected. For nearly twenty years, leading architects have accorded Truscon Waterproofing an outstanding preference. Truscon's remarkable record of results provide an excellent reason why.

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ANNOUNCEMENTS

Harry W. Bogner, architect, formerly of the firm of Judell and Bogner, architects, has opened his own offices at 759 North Milwaukee Street, Milwaukee, Wis., and would appreciate receiving manufacturers' samples and catalogs.

Charles Dana Loomis, architect, announces the removal of his office to 12 East Pleasant Street, Baltimore, Md.

C. O. Boyce, architect, announces the opening of new offices, 924-26 Chamber of Commerce Building, Cincinnati, Ohio. He will continue the general practice of architecture and engineering, and desires manufacturers' samples and catalogs.

Jock D. Peters, designer, announces that W. F. Ruck, architect, is no longer associated with him. Mr. Peters requests that manufacturers' samples and catalogs be sent to him at 507 Fine Arts Building, Los Angeles.

Norman Hatton, architect and engineer, announces the removal of his offices in the O. R. C. Building to 829 Higley Building, Cedar Rapids, Iowa.

Wilfred Lockyer, architect, announces that his address has been changed from P. O. Box 884, Gulfport, Miss., to Box 2, Route 3, Picayune, Miss.

The firm of F. C. Hirons-F. W. Mellor has been dissolved. Frederick W. Mellor, architect, will continue his practice at 25 West 45th Street, New York City.

Charles M. Lobejager, architect, has discontinued his temporary office at 50 Glen Street, Glen Cove, L. I., and will continue the practice of architecture at 1801 147th Street, Whitestone, L. I.

Harold Holmes Owen, architect, formerly of Owen and Osberg, architects, has opened his own office at 3 North State Street, Concord, N. H., and requests that manufacturers' literature be sent to that address.

A CORRECTION

In the November issue the house of G. Lyman Paine, Jr., should have been credited to Mr. Paine as architect instead of to John Crosby Moore.

Abbott

PARKER MORSE HOOPER

The Record is happy to announce that Parker Morse Hooper has joined its staff as Consulting and Contributing Editor. Mr. Hooper will collect information on certain timely problems which he is especially well qualified to investigate. Six years of responsibility for editing The Architectural Forum has given him a wide knowledge of sources of professional news and a still longer experience as a practicing architect has clarified his judgment as to practical applications of news. Beginning with the February issue he will begin to publish news reports on such subjects as methods currently employed with success for obtaining clients; economies achieved by architects who have studied operating costs from new angles, and similar topics related to the business of the average architectural practice.

CALENDAR OF EVENTS

Dec. 1	Competition for "esthetic improvement" in design of water tanks, sponsored by Chicago Bridge and Iron Works, Alvert M. Saxe, 430 N. Michigan Avenue, Chicago, architectural advisor.
Dec. 1-6	Ninth National Exposition of Power and Mechanical Engineering, Grand Central Palace, New York City.
Dec. 5-6	The Florida Association of Architects will meet at Fort Meyers, Florida.
Dec. 11	Color lighting. Papers and demonstrations of recent developments. Illuminating Engineering Society. Westinghouse Lighting Institute, Grand Central Palace, 480 Lexington Avenue, New York City.
Dec. 16	Address by Arthur Holden, Junior League of the N. Y. Society of Architects. Apply to L. E. Jallade, 15 East 47th Street, New York City.
Jan.-Feb. 1	International Exhibition of Persian Art, Royal Academy, London.
Jan. 8	Underwater illumination. Demonstration of lighting of swimming pools. Illuminating Engineering Society. New York Athletic Club.
Jan. 15	Nominations for Le Brun Traveling Scholarship should be received before this date by the committee, Room 530, 101 Park Avenue, New York City.
Jan. 15-30	Exhibition of cameragraphs by Palmer Shannon, photographer, at the Architectural League, 115 East 40th Street, New York City. Exhibits will include reproductions of architectural drawings and will show the work of New York renderers for the past year.
Jan. 23.	Beaux-Arts Annual Ball, Hotel Astor.
Feb. 1	Closing date for entries for Rome Prize competition. Apply to Roscoe Guernsey, executive secretary, American Academy in Rome, 101 Park Avenue, New York City.
Through Feb.	Annual exhibition of the Architectural League of Greater Miami, Florida.
March 30-April 4	House and Garden Exposition, Grand Central Palace, New York City.
April 18-25	Fourth Biennial Architectural and Allied Arts Exposition, Grand Central Palace, New York City.
June 1-5	International Town Planning and Housing Federation Congress, Berlin.

THE JANUARY ISSUE

Gottlieb

L. P. HOLLANDER STORE, NEW YORK CITY

For the interiors of this fashionable Fifth Avenue store, the designers, Eleanor LeMaire and Jock D. Peters, have created for the display of merchandise a background which is at the same time both simple and luxurious. The various store units—perfume room, toiletries, evening bag room, powder room, jewelry, leather goods, and the like—will be illustrated with exceptionally fine large photographs.

Hedrich-Blessing

PORTFOLIO OF OFFICES

This selection of interiors will be similar to the portfolio of shops and small stores appearing in the current issue but featuring establishments that are seen less often by the general public. A series of views of the office of Joseph Urban, well-known architect and stage designer, will be shown. Other illustrations will include an office by Percival Goodman, the reception room and executive offices of a perfume shop by Thompson and Churchill, and a Wall Street brokerage office by Edward I. Shire, architect.

TECHNICAL NEWS AND RESEARCH: GYMNASIUMS

The problems of gymnasium planning and construction are changing with the development of broader programs of physical education and the development of new social values. In the study of these new determinants well-known authorities in physical education and gymnasium building have cooperated. Topics discussed in the article include greater diversity of gymnasium activities; elimination of the individual stall-shower and locker systems, gallery running tracks and spectator space; decreased use of wall-attached apparatus, with subsequent possibilities of new wall materials, such as cork, tile and glass; increased storage space for additional bleachers; monitors or sawtooth roof construction for skylights.

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Table Tops *Wainscoting* *Base Treads*

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RED ROOFING SLATE, any thickness, rough and smooth texture
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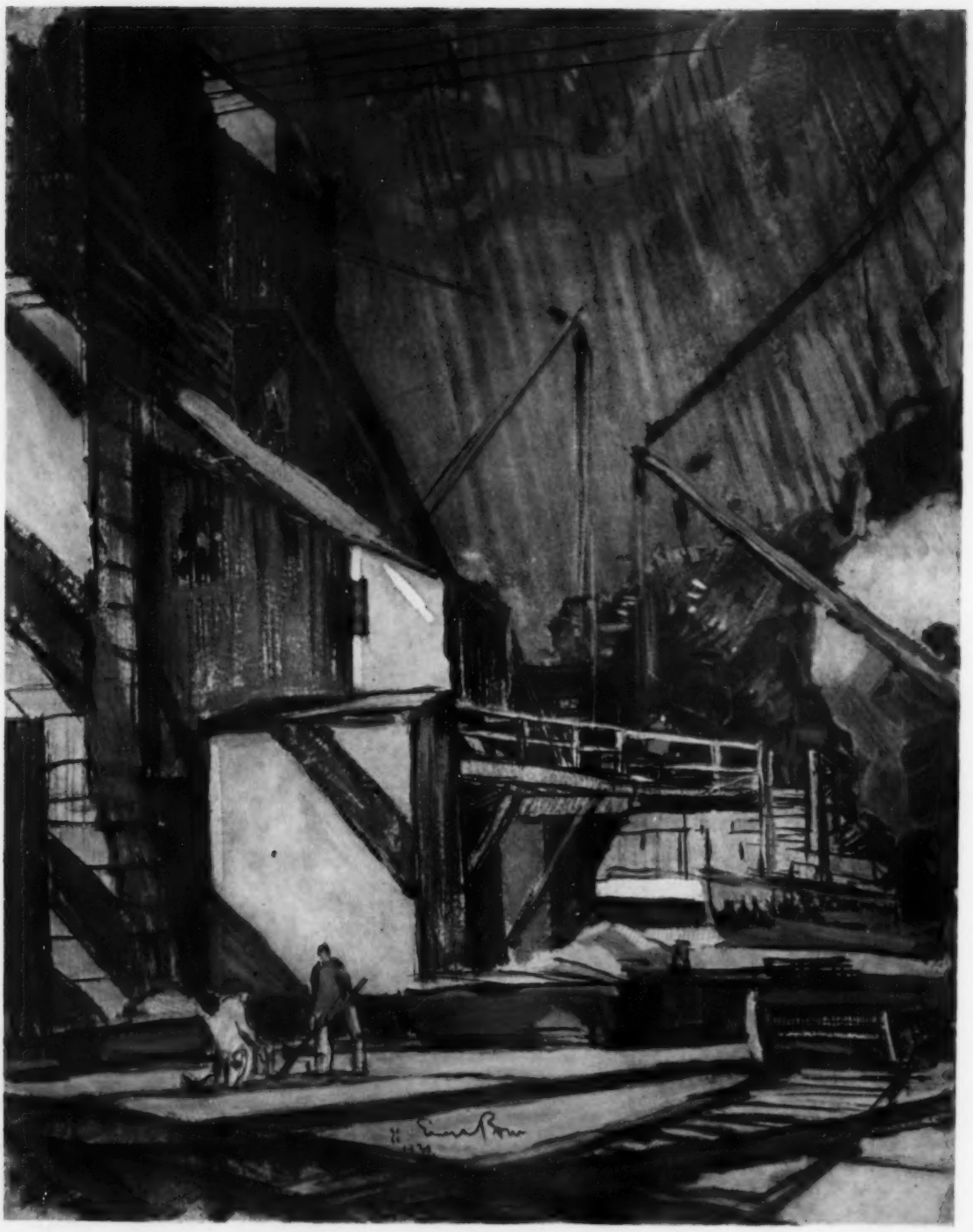
· BRANCHES IN PRINCIPAL CITIES ·



ROCK CRUSHER

Number Three of a series of twelve drawings made at the Fletcher Quarries by Ernest Born.

GRANITE

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WEST CHELMSFORD MASS.

CRANBROOK ACADEMY OF ART
BLOOMFIELD HILLS, MICHIGAN
ELIEL SAARINEN, ARCHITECT

"Triton," by Carl Milles

THE ARCHITECTURAL RECORD

AN ILLUSTRATED
MONTHLY MAGAZINE
OF ARCHITECTURE

VOLUME 68 NUMBER 6 DECEMBER 1930

CRANBROOK ACADEMY OF ART BLOOMFIELD HILLS, MICHIGAN

ELIEL SAARINEN, ARCHITECT

A new principle of art instruction and craftsmanship is offered in the Cranbrook Academy of Art, now being built through a bequest by George G. Booth on a rural estate of 260 acres in Bloomfield Hills, 19 miles north of Detroit.

Here, in a congenial atmosphere, may come the younger art workers from schools, trades and professions—to study and develop without the necessity of considering means of livelihood. Also mature architects, painters, sculptors and craftsmen will occupy studios at the academy in order to carry out projects that require research and surroundings favorable to creative effort. The academy is described by Mr. Booth not as a place for study but as a place for work offering the benefits of association with other skilled workers.

Facilities for printing, sculpture, rug making, furniture making, textile designing and metal working are to be offered as well as for architecture and painting. Work in these fields will be carried over directly into industry.

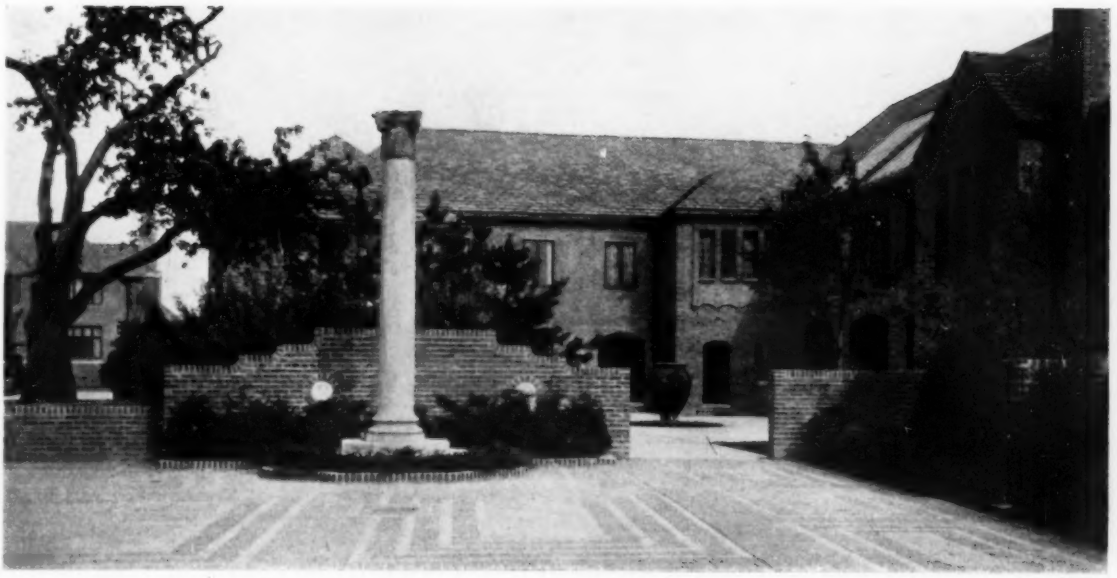
Visiting artists have at their convenience numerous apartments, a dining hall, studios, drafting rooms, experimental workshops, a working library, a museum and lecture rooms. These artists will participate in building the school under the supervision of Eliel Saarinen, architect of the entire project. Carl Milles, the Swedish sculptor, is one of the group who have already settled at Cranbrook.

Young men with promise of artistic talent will be given encouragement to occupy studios and to work under the guidance of more experienced men. This work will be entirely contemporary. The academy is not to be considered as a national art center but rather, by the encouragement given to contemporary artists by placing before them facilities for the working of the various arts and the collected examples of outstanding sculpture, painting, architecture and other crafts, to be considered as exemplifying a principle of instruction applied to a locality which, after experimentation, may be applied to other communities.

CRANBROOK ACADEMY OF ART
BLOOMFIELD HILLS, MICHIGAN
ELIEL SAARINEN, ARCHITECT

Work Shops

Courtyard of Saarinen residence



CRANBROOK ACADEMY OF ART
BLOOMFIELD HILLS, MICHIGAN
ELIEL SAARINEN ARCHITECT

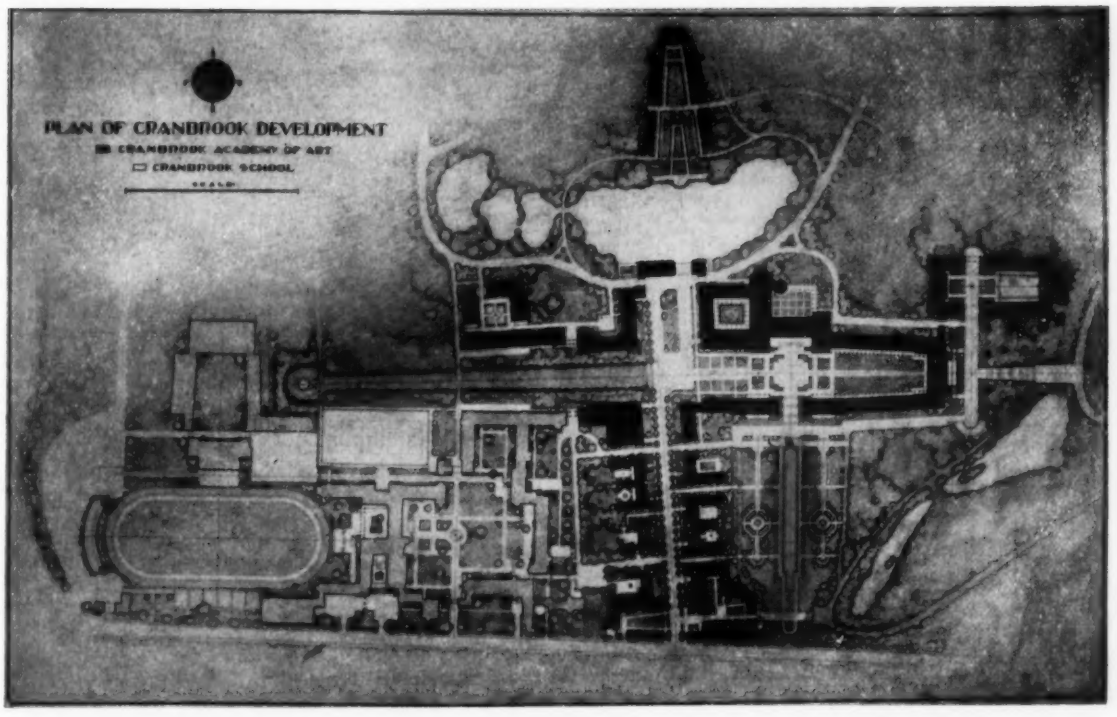
Museum

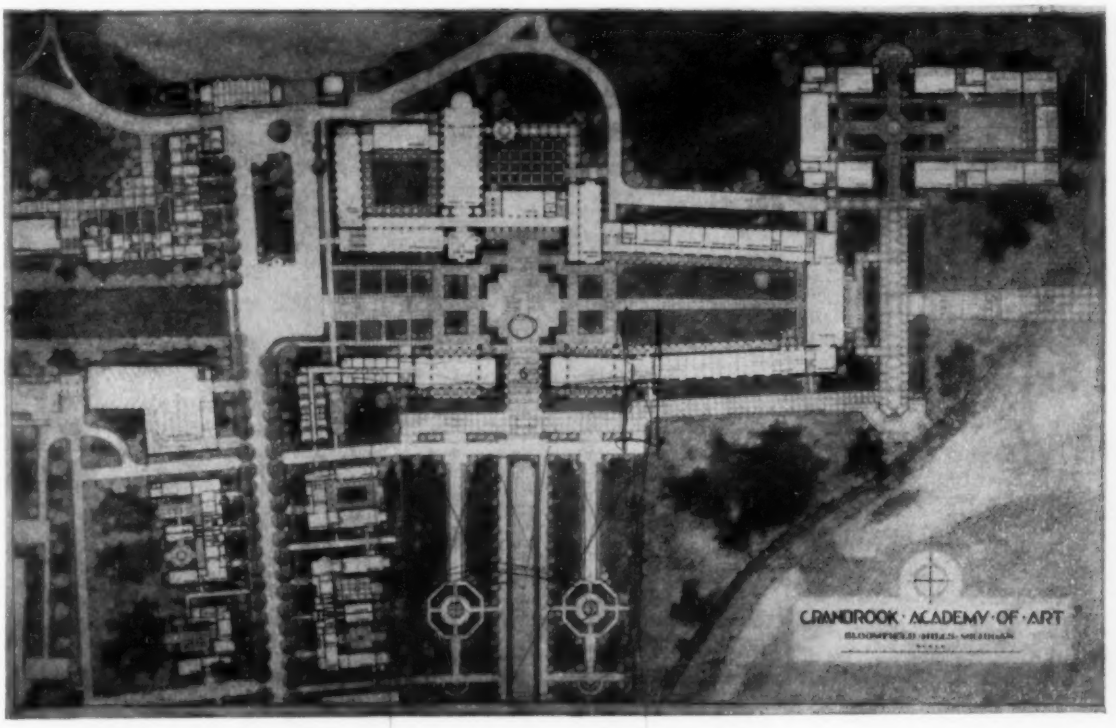
Work Shops

J. W. Hughes

CRANBROOK ACADEMY OF ART
BLOOMFIELD HILLS, MICHIGAN
ELIEL SAARINEN ARCHITECT

Saarinen residence



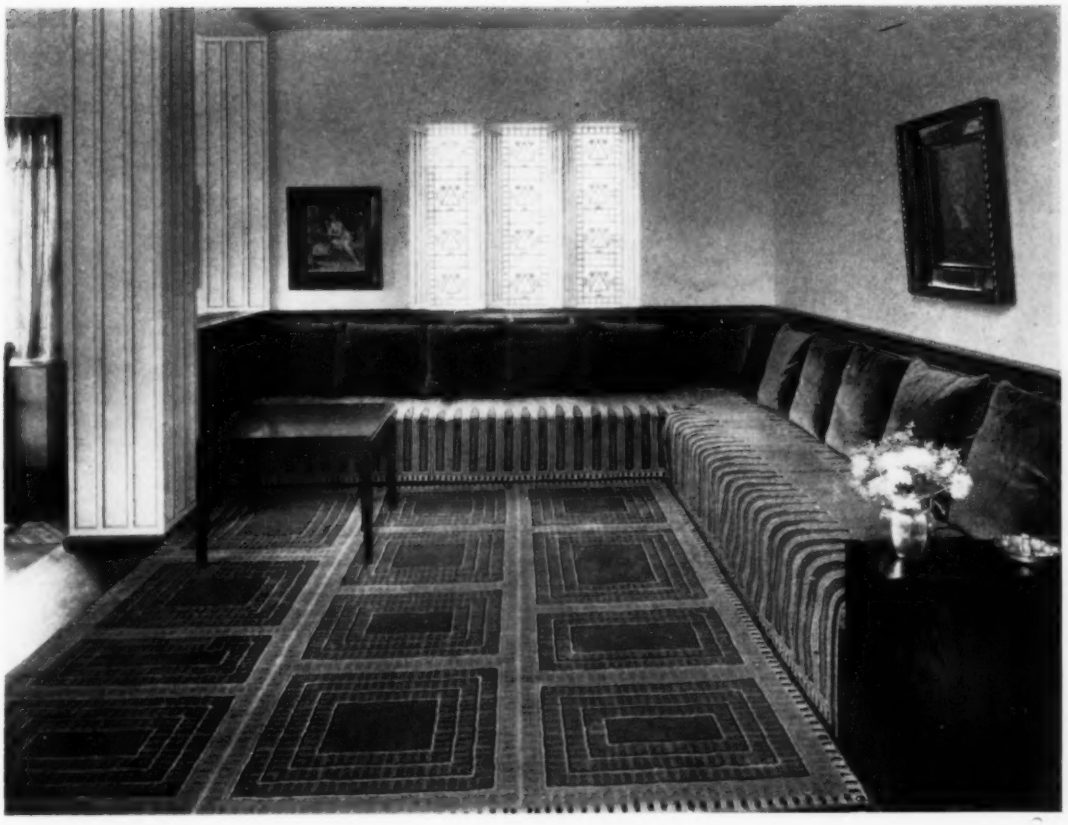


CRANBROOK ACADEMY OF ART
BLOOMFIELD HILLS, MICHIGAN
ELIEL SAARINEN, ARCHITECT

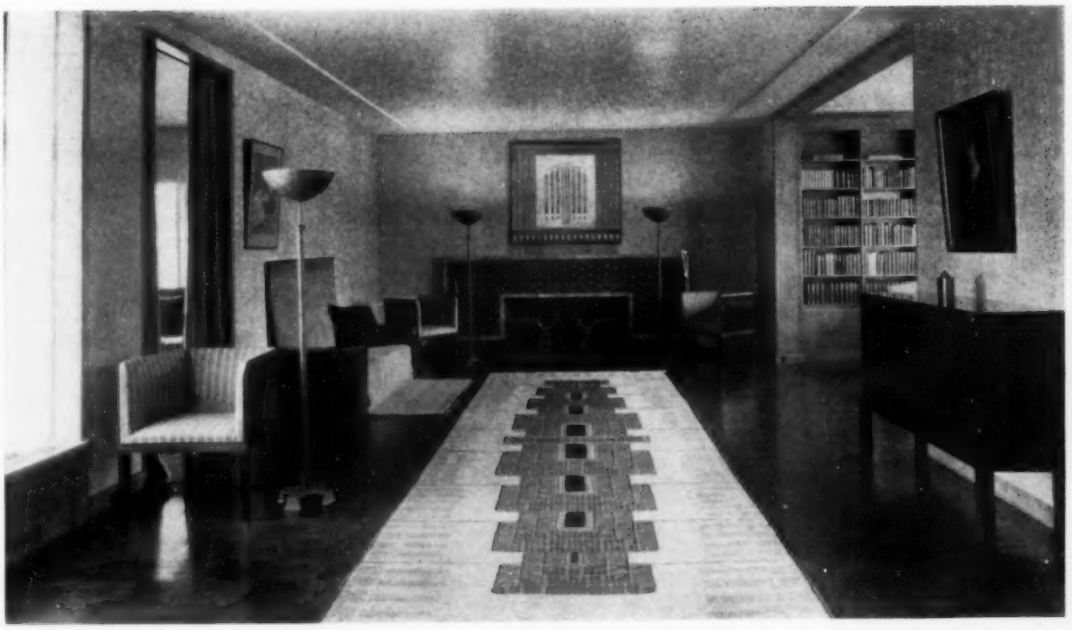
Dining room

CRANBROOK ACADEMY OF ART
BLOOMFIELD HILLS, MICHIGAN
ELIEL SAARINEN, ARCHITECT

Living room of Saarinen residence, dining room adjoining.



Studio corner



CRANBROOK ACADEMY OF ART
BLOOMFIELD HILLS, MICHIGAN
ELIEL SAARINEN, ARCHITECT

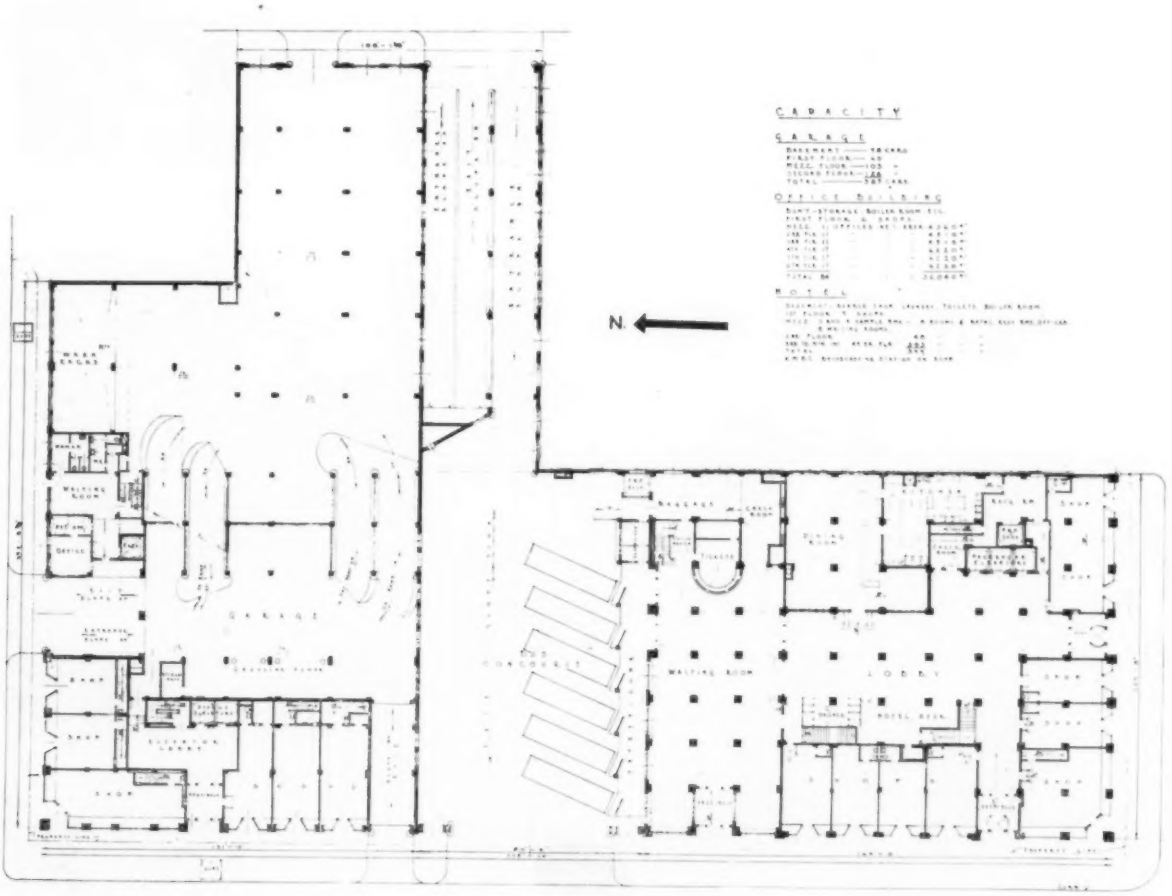
Living room of Saarinen Residence.

AUTO-BUS STATION
HOTEL
OFFICE BUILDING
GARAGE
STORES

UNDER ONE ROOF

KANSAS CITY, MISSOURI
WIGHT AND WIGHT, ARCHITECTS

Anderson

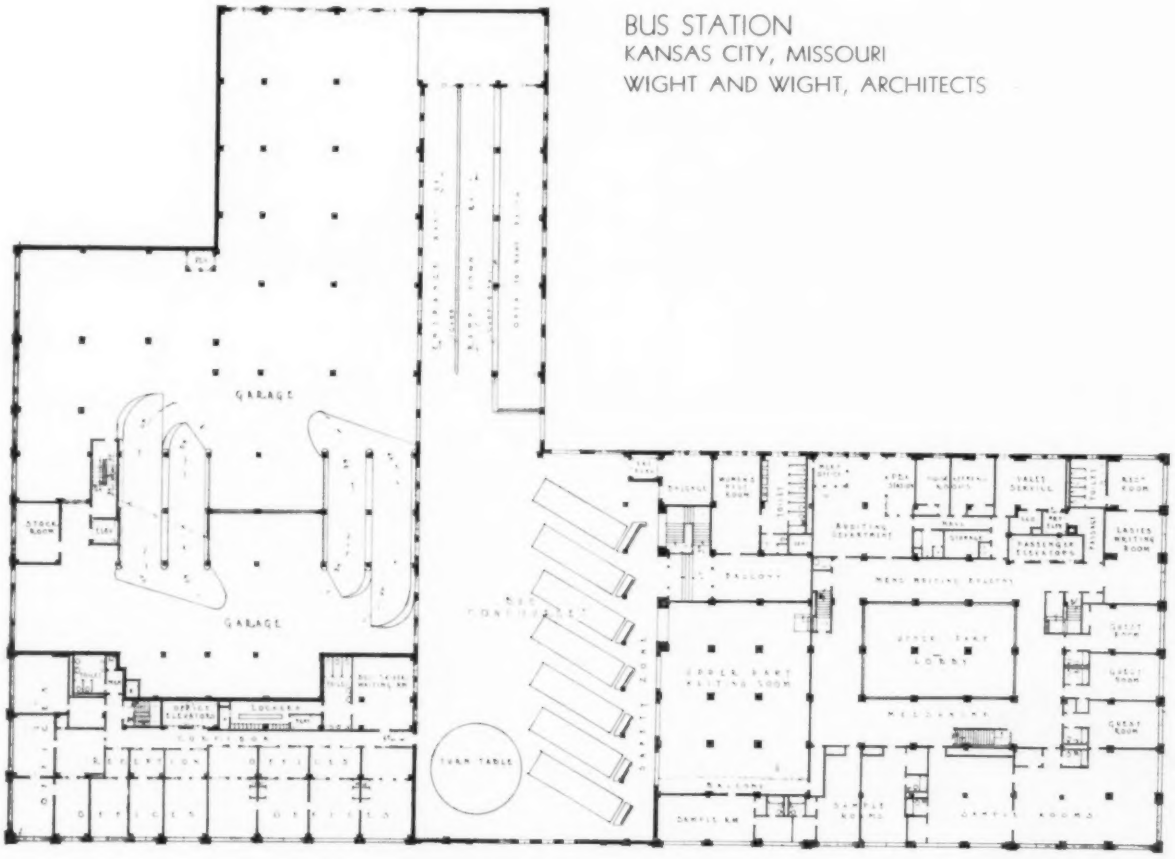


This cluster of commercial buildings—hotel, office building, garage and stores—is grouped closely around an auto-bus station. It is a new type of depot, created by needs of auto-bus travel and differing in many respects from the railway station.

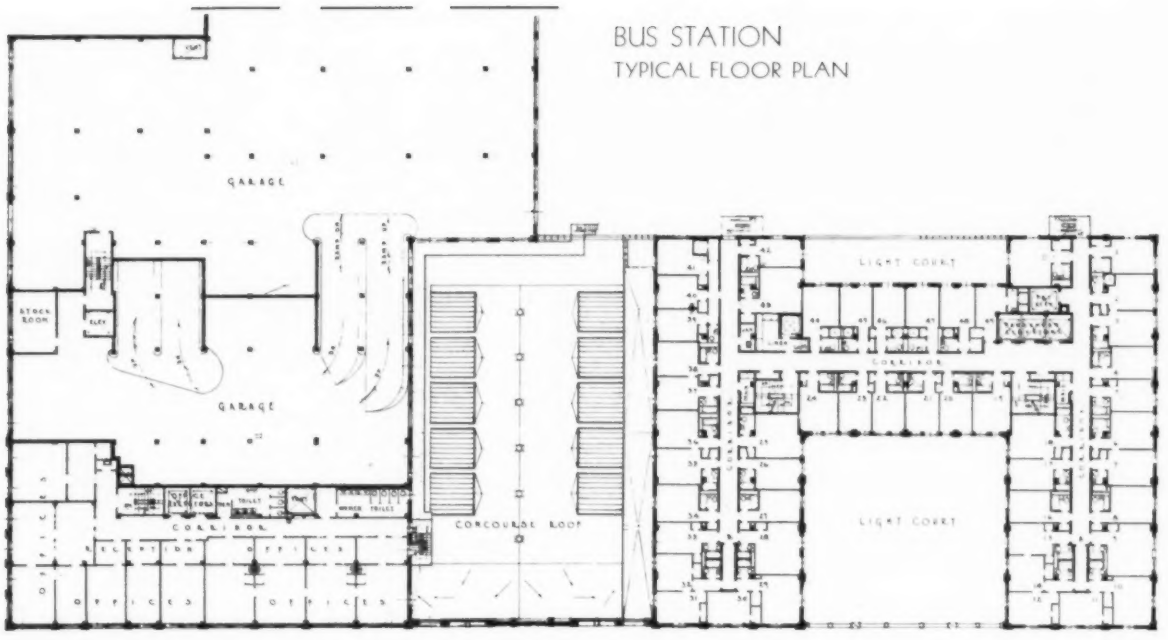
The development occupies an entire block, 375 feet in length, in Kansas City, Mo. It includes a ten-story class A hotel of four hundred rooms with baths and newest equipment; a seven-story office building, a union bus station, and a garage with a storage capacity of four hundred cars. There are also stores and lesser shops at outer street level and within the building. Passengers from the station platform come into the waiting room direct from each concourse where comfort rooms and conveniences have been arranged for the traveller.

The garage has a dual purpose, serving usual local needs for parking and storing cars; it also serves the tenants of the office building who may drive into the garage and go directly to the office building. There are easy grades in relation to the street levels and a non-interfering circulation of plan.

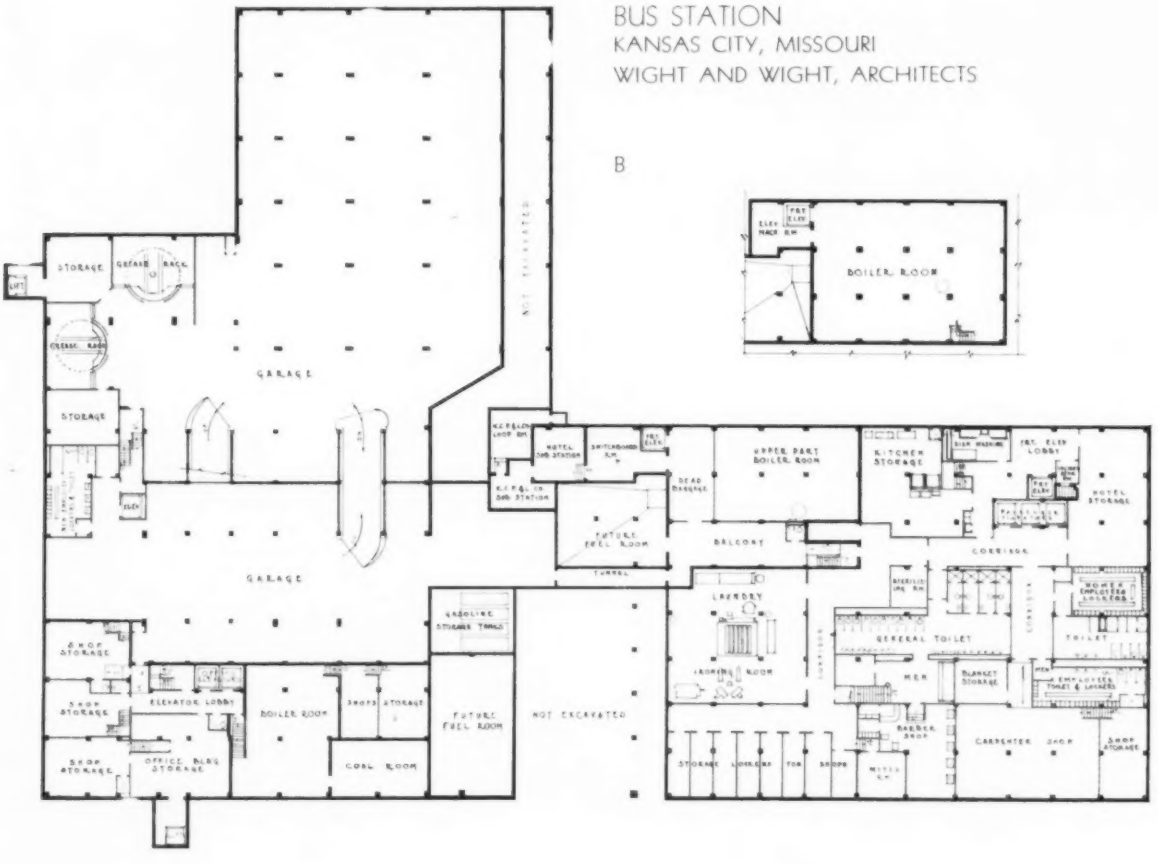
Buildings are constructed of reinforced concrete, with the exception of the long spans of the bus station between the hotel and office building where steel is used.



BUS STATION
KANSAS CITY, MISSOURI
WIGHT AND WIGHT, ARCHITECTS



BUS STATION
TYPICAL FLOOR PLAN



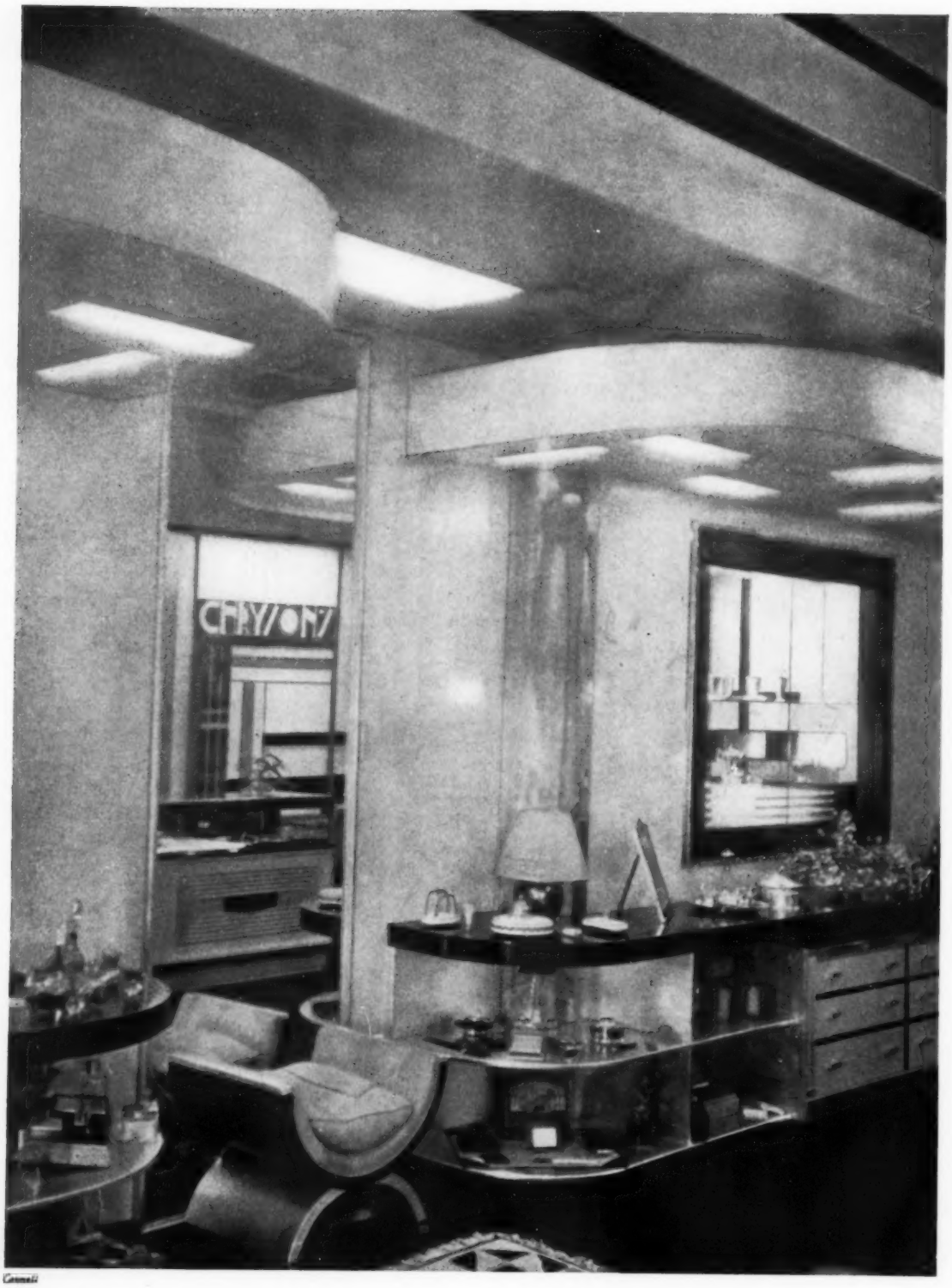
BUS STATION
KANSAS CITY, MISSOURI
WIGHT AND WIGHT, ARCHITECTS

B

Bonninger

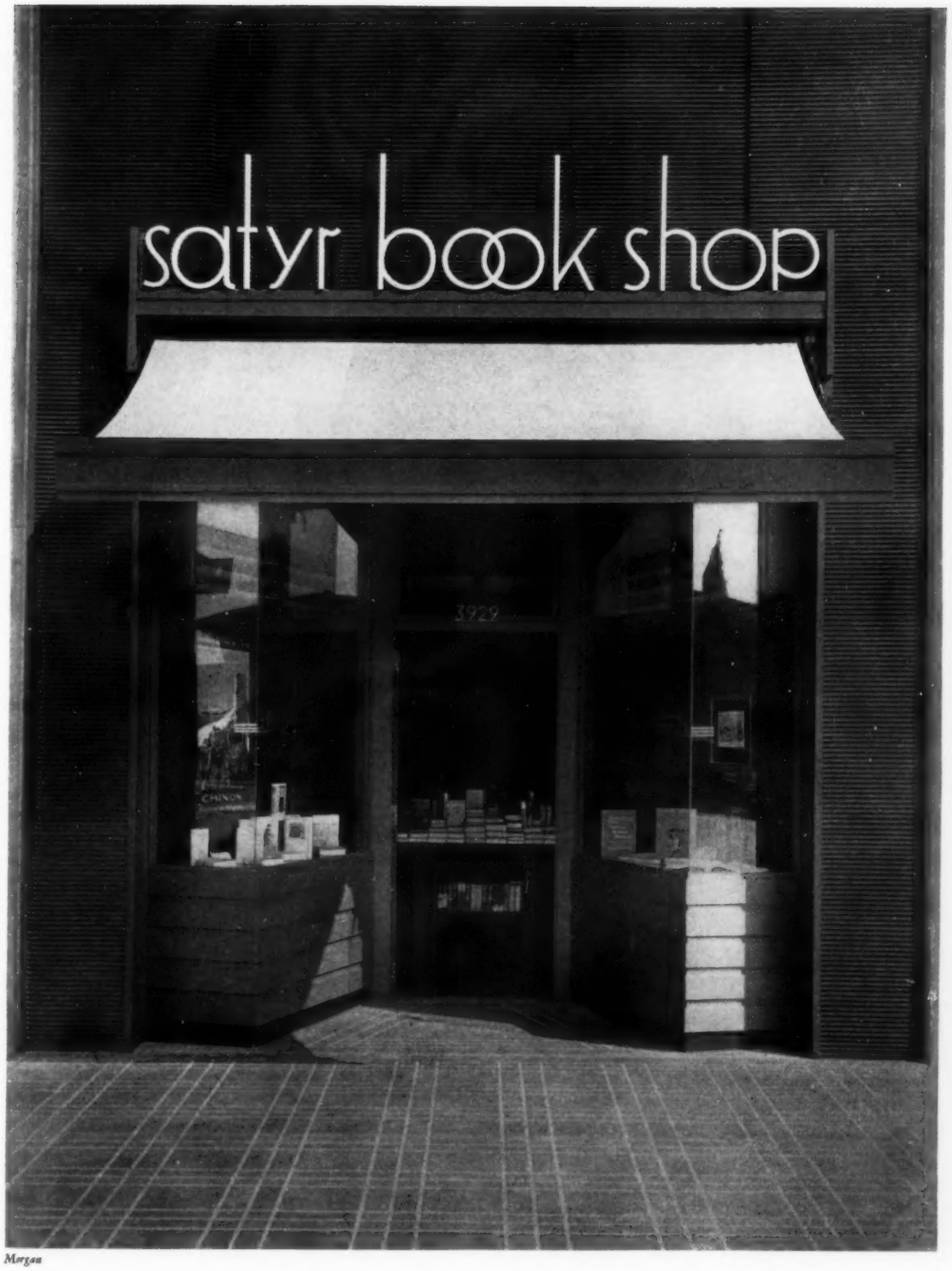
CHRYSON'S STATIONERY SHOP
LOS ANGELES
WERNER WITTKAMP, ARCHITECT

PORTFOLIO OF SHOPS AND SMALL STORES



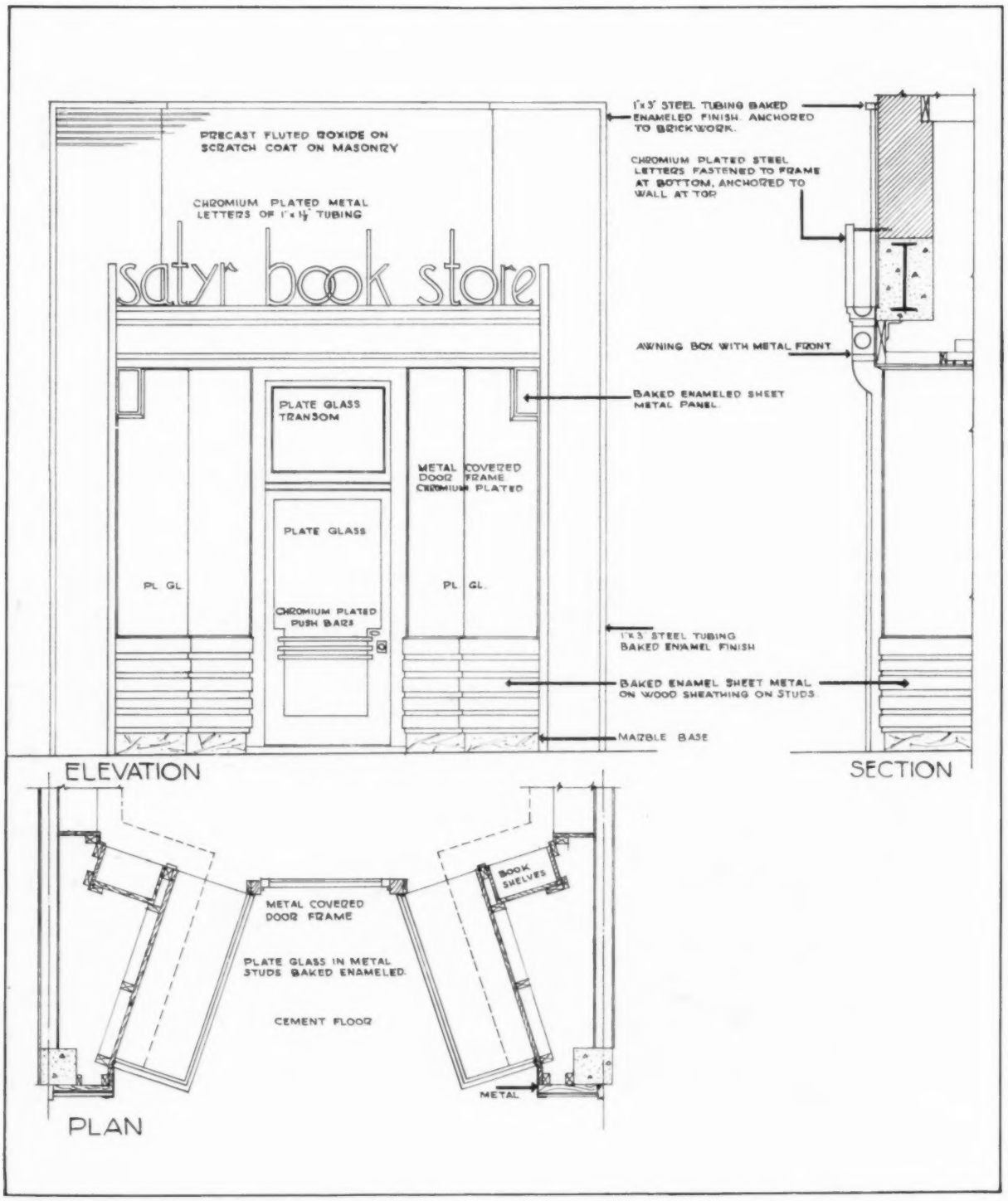
Gottscho

CHRYSON'S STATIONERY SHOP
LOS ANGELES
WERNER WITTKAMP, ARCHITECT

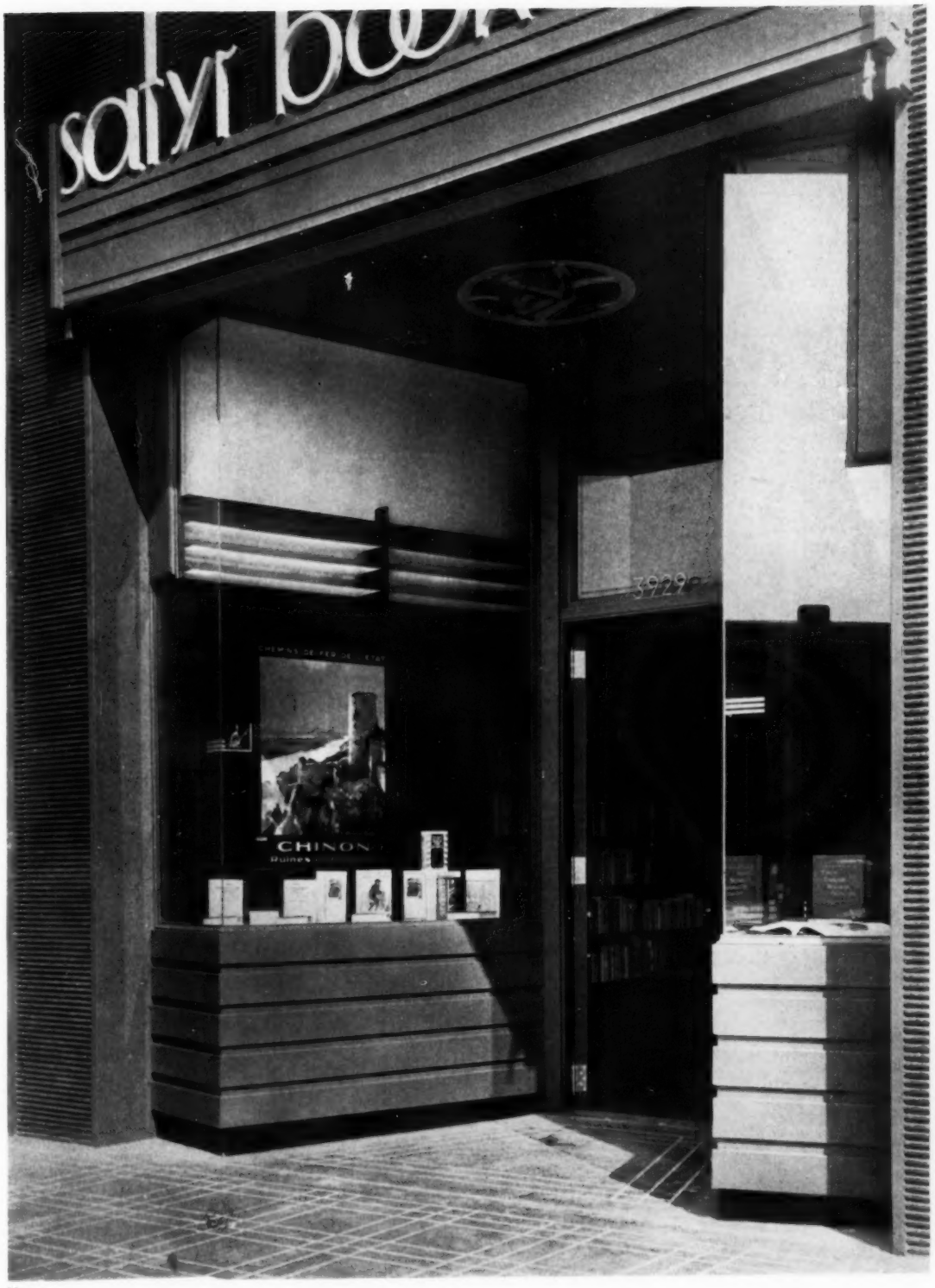


Morgan

SATYR BOOK SHOP
LOS ANGELES
J. R. DAVIDSON, DESIGNER


PRECAST FLUTED BOXIDE ON SCRATCH COAT ON MASONRY
CHROMIUM PLATED METAL LETTERS OF 1"x½" TUBING
satyr book store
PLATE GLASS TRANSOM
PLATE GLASS
PL GL
PL GL
CHROMIUM PLATED PUSH BARS
METAL COVERED DOOR FRAME CHROMIUM PLATED
ELEVATION
1"x3" STEEL TUBING BAKED ENAMELED FINISH. ANCHORED TO BRICKWORK.
CHROMIUM PLATED STEEL LETTERS FASTENED TO FRAME AT BOTTOM, ANCHORED TO WALL AT TOP
AWNING BOX WITH METAL FRONT
BAKED ENAMELED SHEET METAL PANEL.
1"x3" STEEL TUBING BAKED ENAMEL FINISH
BAKED ENAMEL SHEET METAL ON WOOD SHEATHING ON STUDS
MARBLE BASE
SECTION
METAL COVERED DOOR FRAME
PLATE GLASS IN METAL STUDS BAKED ENAMELED
CEMENT FLOOR
BOOK SHELVES
METAL
PLAN

SATYR BOOK SHOP
LOS ANGELES
J. R. DAVIDSON, DESIGNER



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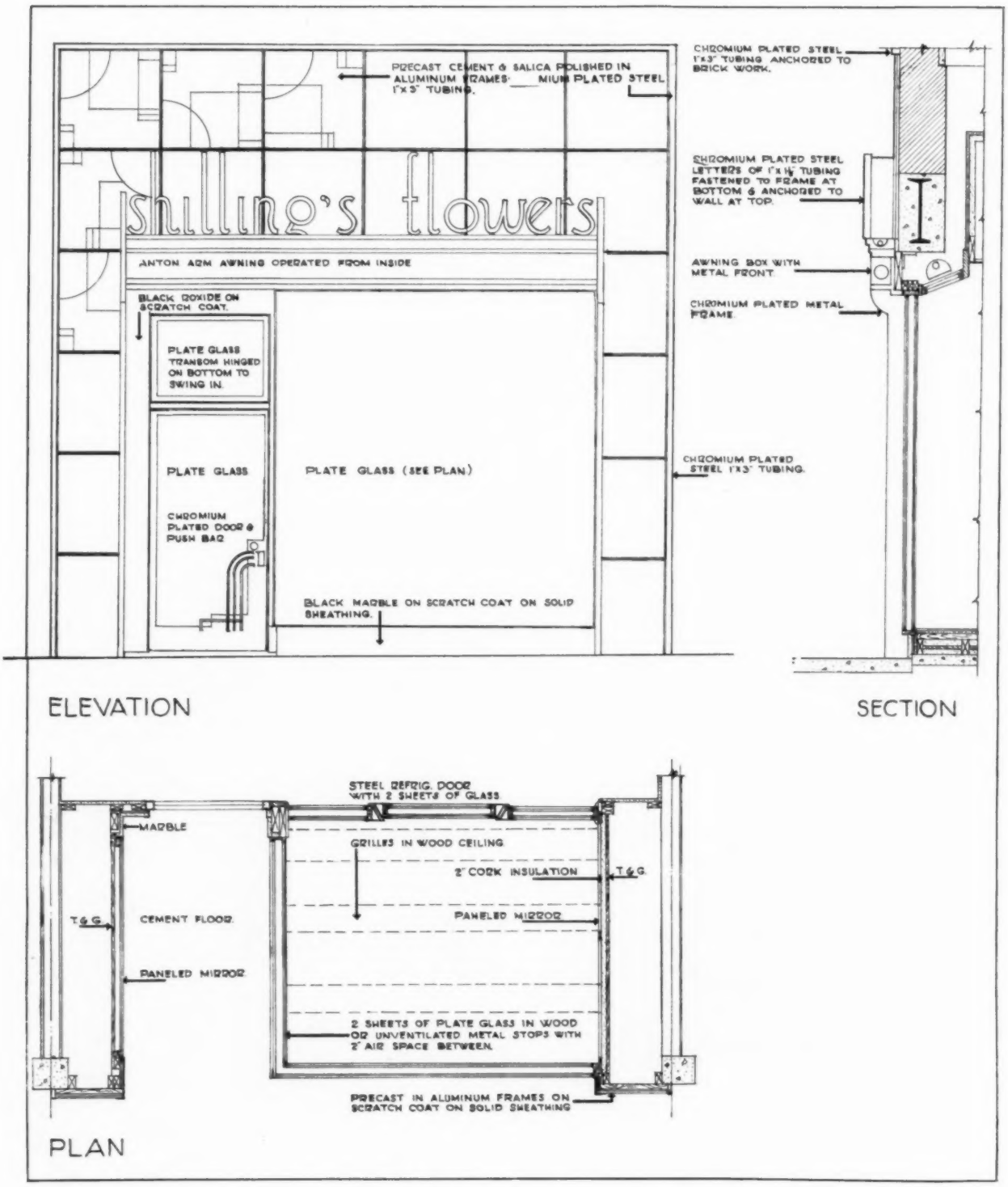
SATYR BOOK SHOP
LOS ANGELES
J. R. DAVIDSON, DESIGNER


PRECAST CEMENT & SALICA POLISHED IN ALUMINUM FRAMES
MIUM PLATED STEEL 1"x3" TUBING.
shilling's flowers
ANTON ARM AWNING OPERATED FROM INSIDE
BLACK OXIDE ON SCRATCH COAT.
PLATE GLASS TRANSOM HINGED ON BOTTOM TO SWING IN.
PLATE GLASS
CHROMIUM PLATED DOOR & PUSH BAR
PLATE GLASS (SEE PLAN)
BLACK MARBLE ON SCRATCH COAT ON SOLID SHEATHING.
CHROMIUM PLATED STEEL 1"x3" TUBING ANCHORED TO BRICK WORK.
CHROMIUM PLATED STEEL LETTERS OF 1"x½" TUBING FASTENED TO FRAME AT BOTTOM & ANCHORED TO WALL AT TOP.
AWNING BOX WITH METAL FRONT
CHROMIUM PLATED METAL FRAME
CHROMIUM PLATED STEEL 1"x3" TUBING.
ELEVATION
SECTION
STEEL REFRIG. DOOR WITH 2 SHEETS OF GLASS
MARBLE
GRILLES IN WOOD CEILING
2" CORK INSULATION
T & G
T & G
CEMENT FLOOR
PANELED MIRROR
PANELED MIRROR
2 SHEETS OF PLATE GLASS IN WOOD OR UNVENTILATED METAL STOPS WITH 2" AIR SPACE BETWEEN.
PRECAST IN ALUMINUM FRAMES ON SCRATCH COAT ON SOLID SHEATHING
PLAN

FLOWER SHOP
LOS ANGELES
J. R. DAVIDSON, DESIGNER

Weber

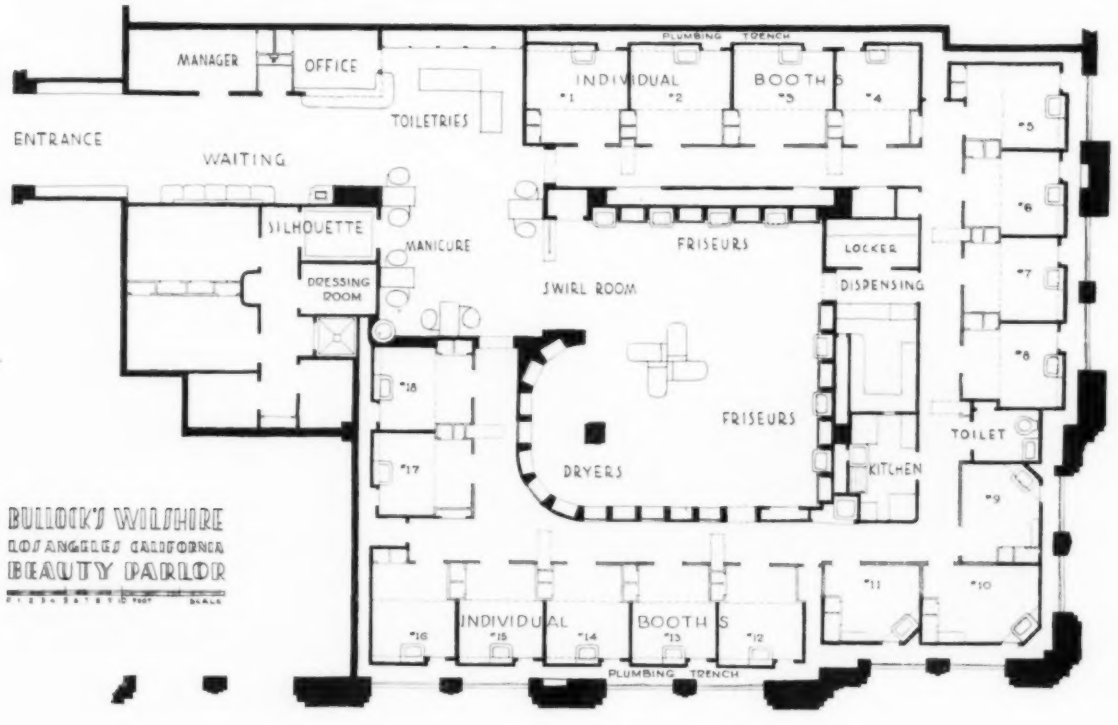
LAMSON AND HUBBARD BUILDING
BOSTON
ISIDOR RICHMOND, ARCHITECT

A DEPARTMENT STORE BEAUTY PARLOR

LOS ANGELES

Mott Studios

Swirl room



JOHN WEBER AND ELEANOR LEMAIRE, DESIGNERS

DESIGNED BY JOHN WEBER AND ELEANOR LEMAIRE

Matt Studios

Dryers

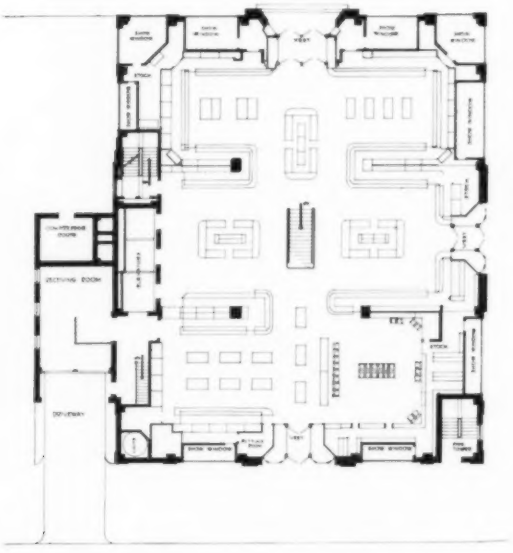
Manicure tables

BULLOCK'S WILSHIRE BEAUTY PARLOR
LOS ANGELES

A SUBURBAN DEPARTMENT STORE

Richards

STRAWBRIDGE AND CLOTHIER DEPARTMENT STORE
BRANCH AT ARDMORE, PENNSYLVANIA



Congested streets and inadequate parking facilities in "downtown" shopping districts have caused many large department stores to open suburban branches. These have been found successful.

Ground floor plan

DREHER AND CHURCHMAN, ARCHITECTS

Richards

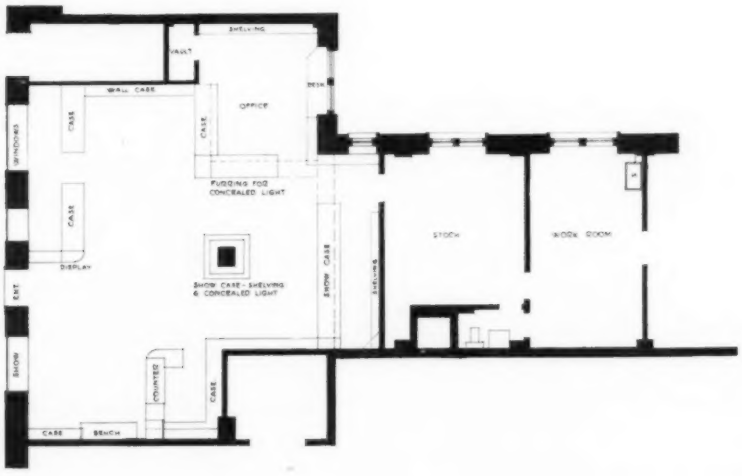
STRAWBRIDGE AND CLOTHIER DEPARTMENT STORE
BRANCH AT ARDMORE, PENNSYLVANIA

Basement plan

A CONFECTIONERY SHOP

Wurts

EMMA BRUNS' CONFECTIONERY SHOP
NEW YORK CITY



Walls: peach.

Woodwork: figured gumwood.

Counters: walnut.

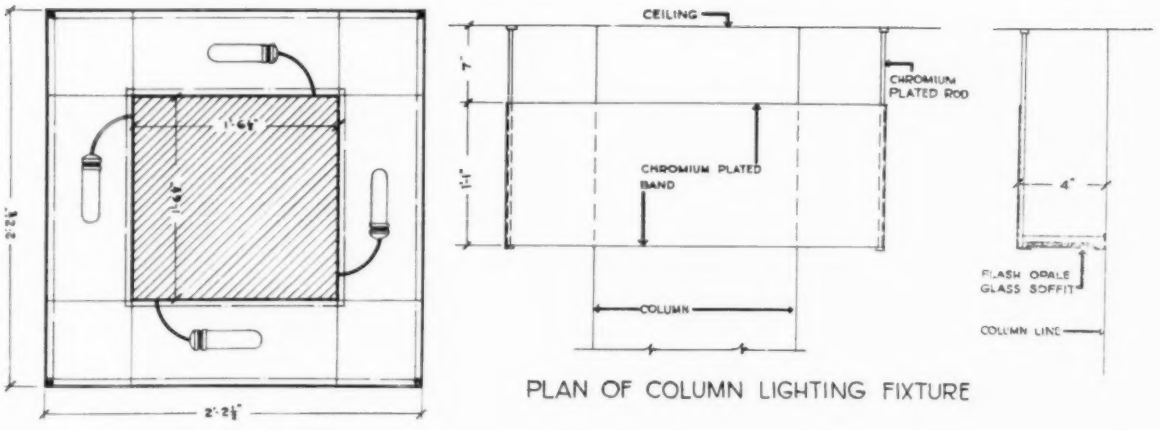
Metal work: chromium-plated.

Flooring: linoleum (terra cotta color).

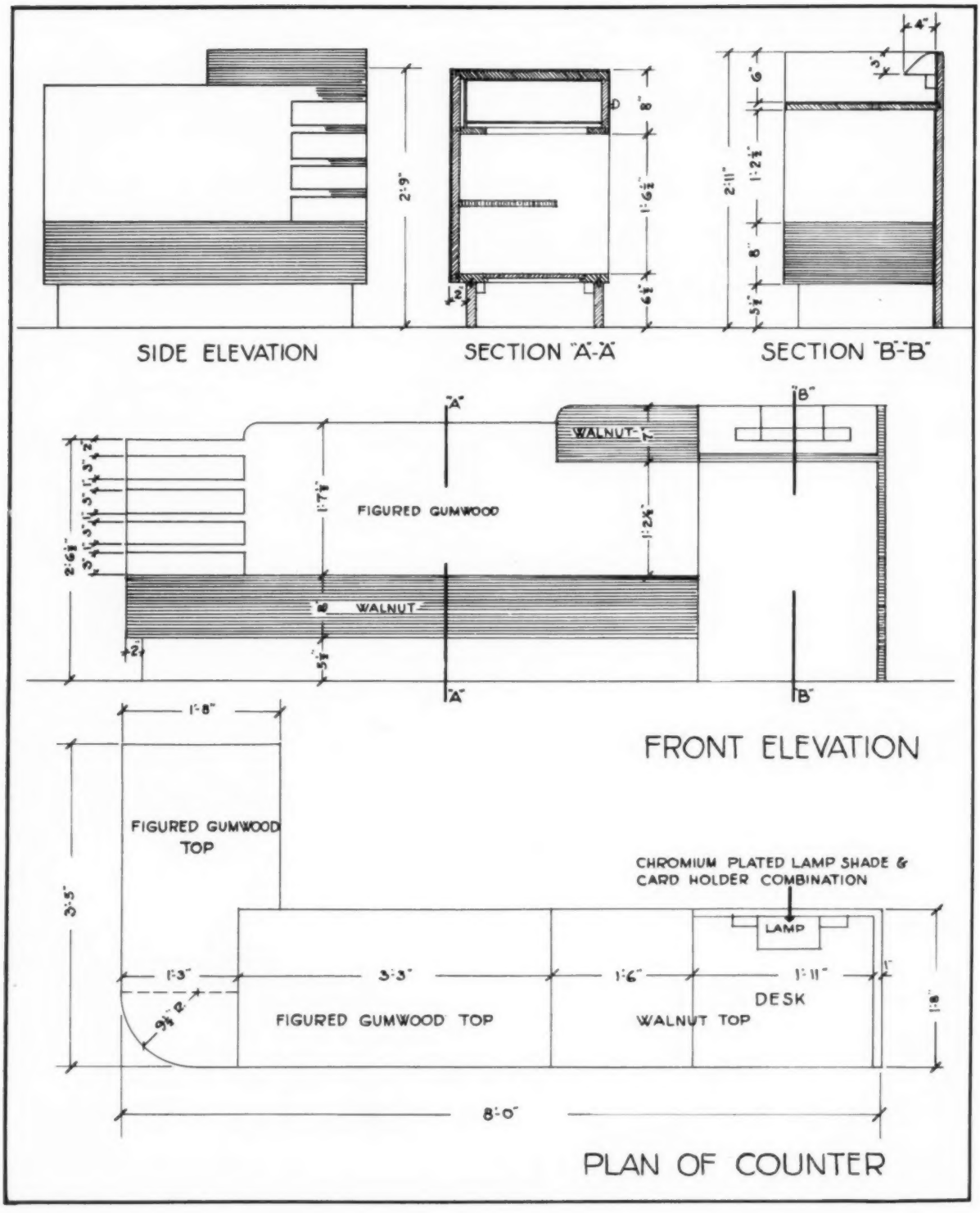
JO BRANDES, DESIGNER

Wurts Bros.

EMMA BRUNS' CONFECTIONERY SHOP
NEW YORK CITY



PLAN OF COLUMN LIGHTING FIXTURE



EMMA BRUNS' CONFECTIONERY SHOP
NEW YORK CITY
JO BRANDES, DESIGNER

CONSTRUCTION COSTS

The nearest approach to a percentage in materials cost reduction is found in cases where bids were refigured from plans drawn last year. On this basis costs appear to be approximately 13 per cent below those of 1929. The National Lumber Manufacturers Association shows a decline of 13 per cent on single family residence construction in the Middle-West. These figures are based upon a guaranteed bid in August 1930 as compared with the actual construction of a house built from the same plans in 1929. The reduction is divided as follows:

Excavating	35%	Plumbing, heating	2%
Masonry	12%	Painting	16%
Millwork	20%	Finish hardware	35%
Lumber	14%	Wiring	10%
Carpenter labor	10%	Tile	24%
Plastering	3%	Electric fixtures	25%

On larger work the Austin Company, engineers and builders of Cleveland, Ohio, state that building costs are 15 to 20 per cent below the average of the past 10 years. Also the United States Treasury Department, which has charge of constructing post offices and other federal buildings, states that the decline east of the Mississippi amounts to 15 per cent based upon a comparison of bids in 1929 and 1930 for identical buildings.

The important point is, have prices reached the bottom or will they go still lower? In this connection we quote the following statement from Col. John C. Hegeman, President of the Hegeman-Harris Co., Inc.: "We are undoubtedly in a 'buyers' market' in the building business. This condition runs all through the industry, including manufacturers of the numerous items which are required in construction.

"Costs have been in a definite downward trend for more than a year and in the opinion of many builders of the United States this price trend has reached a point where stabilization at existing levels is at hand. Wage scales are fixed and no one desires a downward revision. Productive efficiency, however, has increased in a marked degree. Material costs have undergone a decided drop in all departments and, we believe, have reached a point where further reductions will be small.

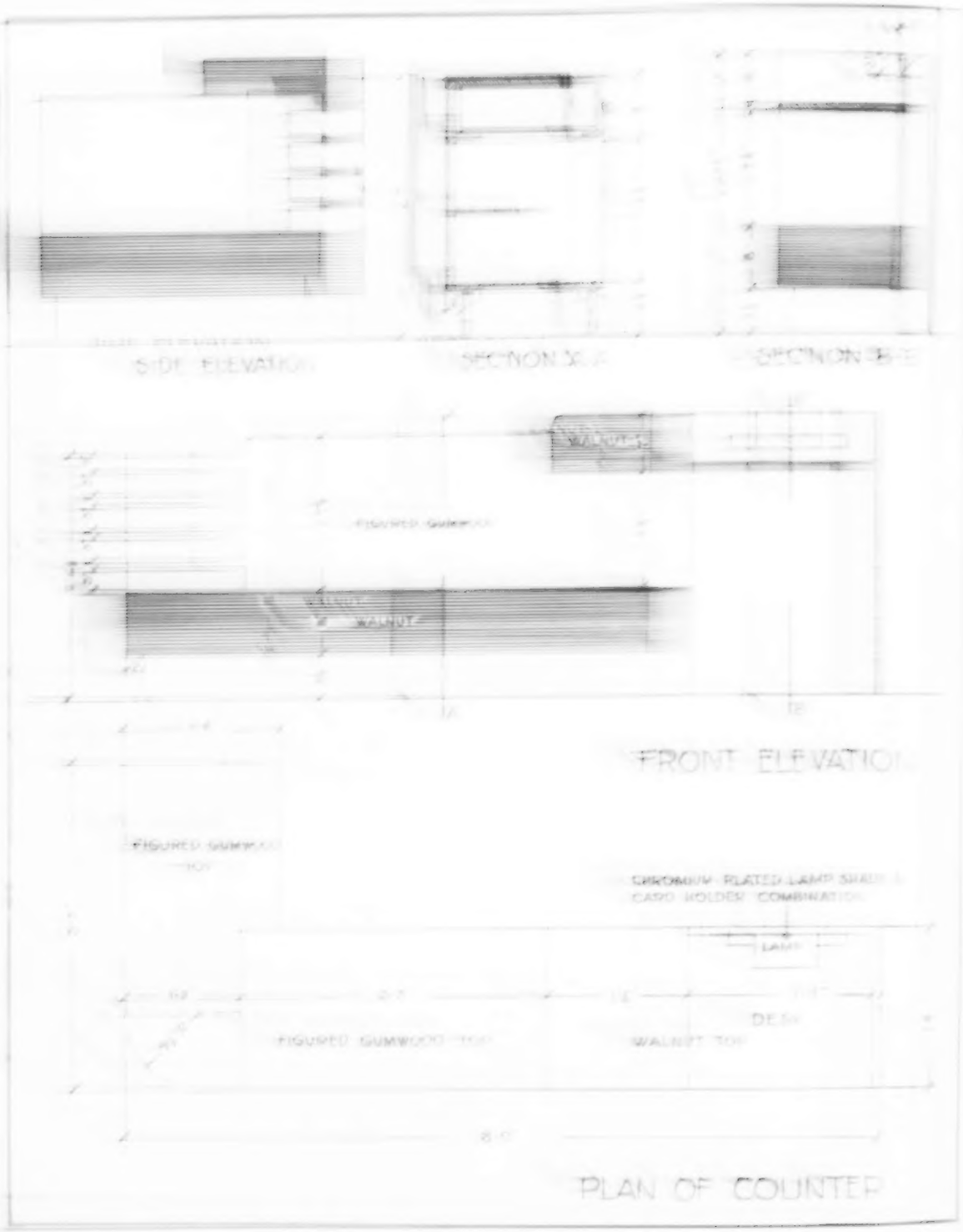
"In the light of these facts it would seem good business judgment for institutions, corporations, and other large investors in building construction to take advantage of this 'buyers' market' and proceed with construction programs which have been deferred because of price uncertainties incident to such a market."

Although the price of 1.60 Pittsburgh has been definitely accepted as the prevailing price for steel shapes and plates, there is a decided tendency towards stabilization at the present prices. The action of the Carnegie Steel Company in announcing the present prices as a minimum is considered by the trade as a decided stand for that purpose and will, no doubt, be so interpreted by other steel producers.

Other factors pointing toward stabilization at present prices are the large purchases by the American Radiator Company of 50,000 tons of pig iron and the abrupt upturn in the price of copper. Although the smallest percentage of capacity is being utilized at present, there has been a large amount of business in sight from railroads and public works construction, all of which is expected by fabricating shops to put an end to the present price-cutting era.

The lumber situation is somewhat different than that of steel, due, no doubt, to the greater number of producers and the lack of cohesion among them. The last figures obtainable showed that for 616 softwood mills the total production was 222 million feet, shipments were 238 million, and new orders amounted to 211 million. The market is considerably weakened and prices reflected this weakness. The hope for improvement lies in improved foreign shipments and an unexpected improvement in residential construction.

PETER A. STONE



EMMA BRUNS' CONFECTIONERY SHOP
NEW YORK CITY
JO BRANDES, DESIGNER

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Excavating	33%	Plumbing, heating	2%
Masonry	12%	Painting	16%
Millwork	20%	Finish hardware	33%
Lumber	14%	Wiring	10%
Carpenter labor	10%	Tile	24%
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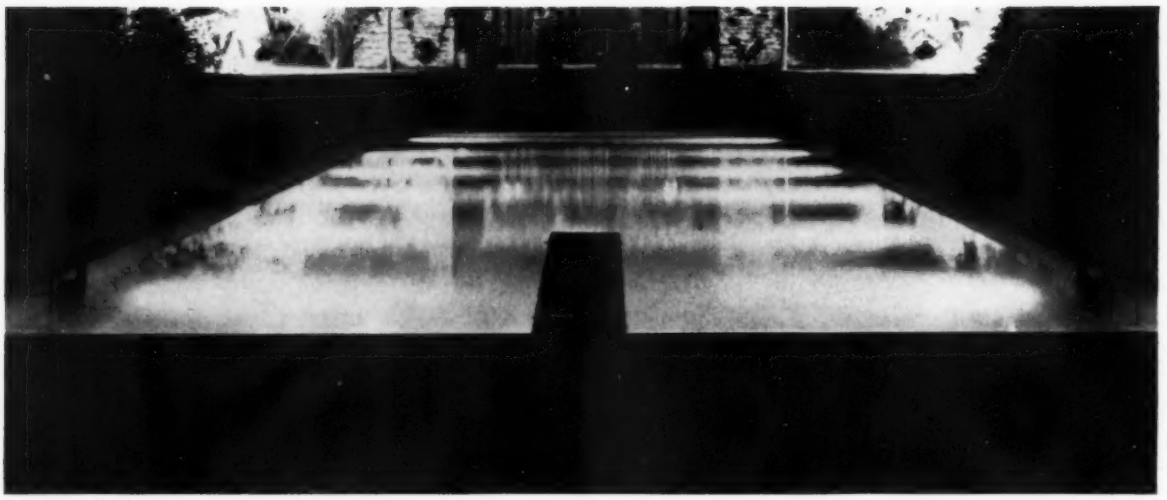


Westinghouse Lamp Co.

UNDERWATER LIGHTING FOR SWIMMING POOLS

Swimming pool illumination should come from a maximum number of small units spaced uniformly around the pool but in general not installed in the shallow end excepting where the pool is very wide. It is the conclusion of Mr. E. W. Beggs, illuminating engineer for the Westinghouse Lamp Company, that all units should be located about the same distance below the water level and that this distance, in general, should be approximately 2½ feet to the center of the unit in order to bring it below those points on the wall against which swimmers and water polo players will push off. It is also concluded that the major amount of the light should come from the units mounted along the two side walls but that light should also be thrown into the pool from units mounted in the deep end wall, particularly to illuminate for diving. All units should in general be equipped with lenses which will spread the light beam out into a wide horizontal fan. The units in the deep end should be equipped with lenses arranged to direct part of the light downward.

Sketches show the common type of installation, which is called the niche mounting, with which the water seal of the pool wall is unbroken. Such a device is most effective at least as far as economy of installation is concerned where the pool walls are not free standing as would be the case with the average outdoor pool.

This Aqualux unit can also be installed in several ways in pools already built. The most successful is that used in a private pool on the Randolph-Jacobs Estate, Armonk, N. Y.

In an article that appeared in *Electrical Installation Record*, September, 1930 (pages 33-35), Mr. Beggs points out that this new method of pool lighting has safety and hygienic advantages. "Swimmers are always in distinct view of lifeguards and any mishaps are instantly seen. Light rays shooting through the water show any material in suspension as an indication of improper filter performance and clean water is thus maintained.

"The diagram illustrates the lighting of a 'standard indoor pool.' The minimum lighting load is equal to twice the water surface area in square feet, which is 1875 x 2, or 3750 watts. At least 16 250-watt units are required. In a standard pool of this kind, with the length three times the width, about 25% to 30% of the light should come from the deep end units. Four units at the 2½ foot depth are

mounted there as shown, to provide this light. One unit is added for a total of 16 to balance the load and give an even number on each side. The remaining units are distributed equally and directly opposite one another along the side walls, 12′ 6″ apart at this same depth. No units are located at the shallow end except where width is 100 feet or more. To eliminate dark corners, the first unit is mounted 6′ 4″ from the deep end wall.

"Each fixture should be placed in a cast bronze box molded in the pool wall or, where economy is vital, separate wall niches formed in the concrete may be used. To relamp or otherwise service the unit, it is only necessary to draw it out of the niche (see diagram), and above the water. A length of flexible waterproof cable is attached to each unit and stowed in a flush bronze floor box, located in the walk above water. As the unit is taken out this cord feeds down through the ¾″ brass pipe and, conversely, when the fixture is replaced, the excess cable is drawn up and coiled away. The position of the unit on the walk ready for servicing is shown in the diagram.

"Underwater lighting in outdoor pools is carried out in the same manner. Submerged units in the walls project their luminous flux through the water. Pools of ordinary size, less than 75 feet wide, use small units because they distribute light evenly. Larger pools frequently install the small units using 250-watt lamps, but the greater number required may make the cost prohibitive. If this is true, it is more economical to use large Aqualux units of 500- or 1000-watt size. These are especially recommended for pools of 10,000 sq. ft. area or more. The 250-watt Aqualux unit is described in accompanying illustrations and diagrams.

"A simple and effective system of wiring and control for underwater lighting is shown by the accompanying diagrams. The three-wire installation provides separate control of alternate units so that

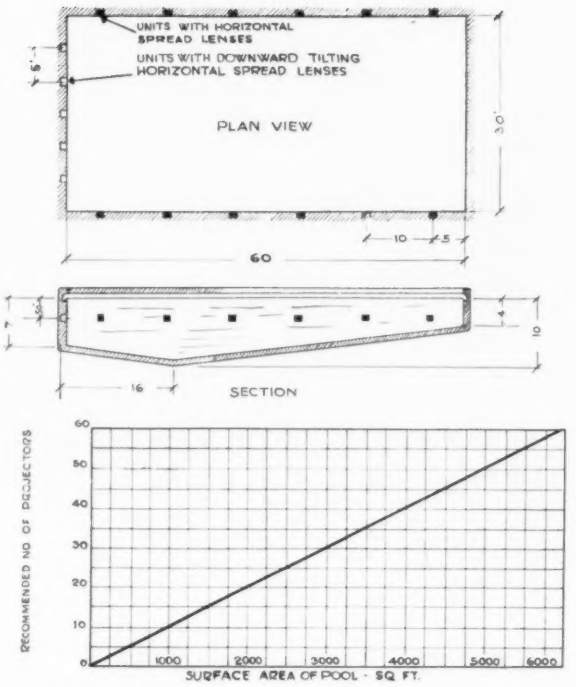
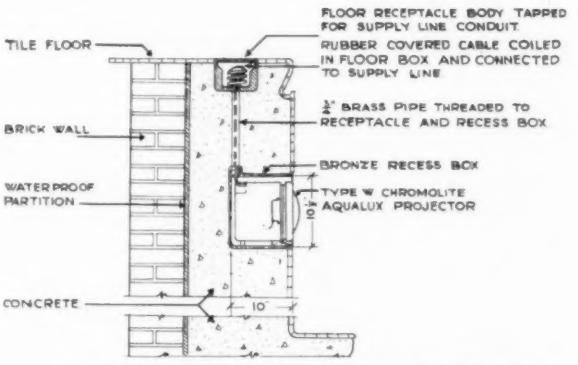
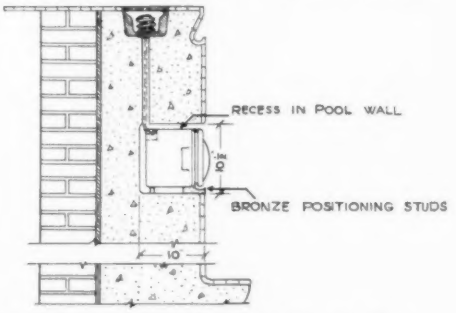


DIAGRAM OF LIGHTING FOR STANDARD POOLS

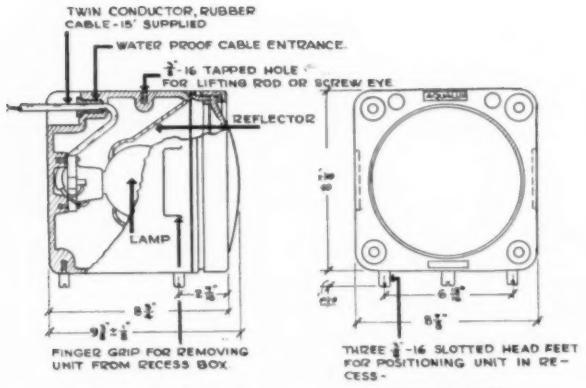

FLOOR RECEPTACLE BODY TAPPED FOR SUPPLY LINE CONDUIT
TILE FLOOR
RUBBER COVERED CABLE COILED IN FLOOR BOX AND CONNECTED TO SUPPLY LINE
¾" BRASS PIPE THREADED TO RECEPTACLE AND RECESS BOX
BRICK WALL
BRONZE RECESS BOX
WATERPROOF PARTITION
TYPE W CHROMOLITE AQUALUX PROJECTOR
CONCRETE

INSTALLATION WITH RECESS BOX - SIDE VIEW

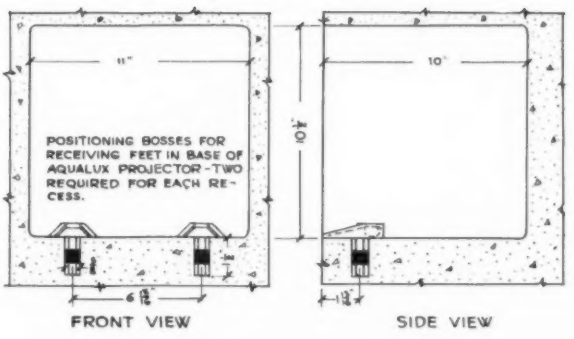


INSTALLATION WITH POSITIONING STUDS
SIDE VIEW

DETAIL OF LIGHTING FIXTURE


TWIN CONDUCTOR, RUBBER CABLE - 15' SUPPLIED
WATER PROOF CABLE ENTRANCE.
⅜"-16 TAPPED HOLE FOR LIFTING ROD OR SCREW EYE.
REFLECTOR
LAMP
FINGER GRIP FOR REMOVING UNIT FROM RECESS BOX.
THREE ⅜"-16 SLOTTED HEAD FEET FOR POSITIONING UNIT IN RECESS.
SIDE SECTION VIEW
FRONT VIEW

TYPE W AQUALUX PROJECTOR


11"
10"
POSITIONING BOSSES FOR RECEIVING FEET IN BASE OF AQUALUX PROJECTOR - TWO REQUIRED FOR EACH RECESS.
FRONT VIEW
SIDE VIEW

BRONZE RECESS BOX
TO BE BUILT INTO WALL OF SWIMMING POOL

novel and attractive lighting effects may be produced, with colored lenses to illuminate the water for special occasions. The lenses are $8\frac{3}{8}$" standard size and can be supplied from the stock of local dealers.

"The area adjacent to a private outdoor pool must be lighted in a manner in keeping with its character. A private installation is generally located where there are few bright lights and where artistic quality is required in the exterior as well as in the pool lighting itself. Light emanating from underwater lighting is only sufficient to illuminate the area within a few feet of the pool. Therefore, floodlighting of shrubbery, trees, walls, etc., within 50 feet or so of the pool, is ideal. The illustration shows this use of indirect illumination for the beautification of adjacent areas. Ornamental lanterns of street lighting type with low-powered lamps mounted on small artistic posts also produce a desirable effect. For outdoor pools special illumination may be needed for diving boards, special swimming apparatus and floats. Floodlights can be arranged to direct their beams to such points, so as to follow the observer's line of vision and give him greatest visibility.

"Public outdoor pools require high levels of illumination around the pool. Ordinary industrial type reflectors mounted 15 to 20 feet above the walk on standards spaced about 20 feet apart may be used. A more refined installation consists of powerful street lighting lamps with refracting glassware directing the light downward to the useful plane. They are mounted 25 to 35 feet high to avoid glare. With industrial reflectors or high-powered street lamps about 10 to 20 watts per running foot of walkway are necessary; or with units spaced 20 feet apart 300-watt lamps are ordinarily required.

"If floodlighting is used, the fixtures should be mounted quite high above the pool level. They should be designed and arranged to sweep the whole area, including the pool itself. However, the greatest intensities from these sources should be directed over the areas adjacent to the pool and onto diving platforms and special apparatus in the water. About two watts should be provided per square foot of area lighted, exclusive of the pool area. For very large installations floodlighting is the simplest and most effective means available for general illumination above the water surface.

"It is scarcely necessary to recommend that in order to enjoy the beauty of underwater lighting there must be no strong surface illumination, particularly since such will result in annoying water reflections, if not very carefully placed and also screened. The clarity of the water is a paramount necessity. Even slight turbidity is fatal to the success of submerged lighting, and the white tile or similar pool lining is almost equally important."

RECENT TECHNICAL DEVELOPMENTS

REDUCING DEAD LOAD SAVING TIME AND INCREASING CONTROL

FIG. 1
TRUSCON WELDED JOISTS

FIG. 2
KALMAN ONE-PIECE EXPANDED JOISTS

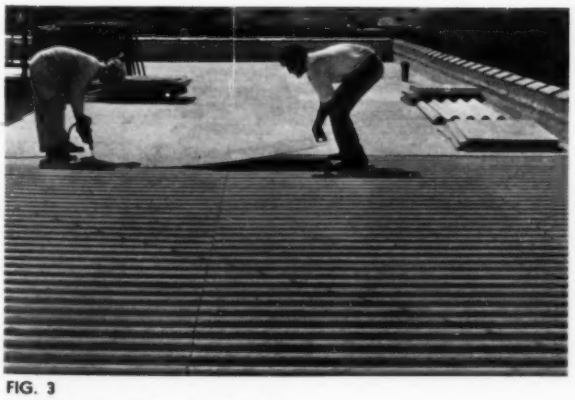


FIG. 3
ENDURO ROOF CONSTRUCTION

LIGHTWEIGHT ROOF AND FLOOR CONSTRUCTIONS

OPEN WEB STEEL JOISTS

Light-weight steel trusses designed for use in light occupancy buildings to support floor and roof panels between main supporting beams, girders, trusses or walls. Made in standard depths from 8″ to 16″ and in lengths to accommodate all spans up to 32′–0″. Spacing of joists from 12″ to 30″. Bridging with struts, wire, rods. The underslung design of the bearing insures low floor height.

Advantages

Standardized lengths, depths and carrying capacities insure easy and accurate design. Complete shop fabrication. Low weight. Reduced field work. Unskilled labor. No shoring. Ready concealment of pipes and electric circuits within depth of floor.

WELDED JOISTS

Truscon Steel Company
(Fig. 1)

Top and bottom chords of wide T-shaped members. The bottom T continues to the bearing, where it is welded with the web plate and the top chord to form a solid I-beam. Web members continuous from end to end for transmission of stresses. Electric welding.

ONE-PIECE EXPANDED JOISTS

Kalman Steel Company
(Fig. 2)

Joists produced from small I-beams by slitting the webs and drawing the flanges apart to the required depth of the truss. The result is a double lattice truss in which the chords and the web members are of one piece. The bottom chords are bent up at the ends providing a 2½″ depth at the bearing.

ENDURO

R. A. Laidlaw, patentee, San Antonio, Texas
(Fig. 3)

Corrugated asbestos cement sheets (*Transite*) carry the loads between the supports. Flat sheets of the same material fastened on top of the corrugated sheets with wood screws provide a flat surface for finished treatment. The corrugated sheets are screwed directly to the supporting members with steel screws. The

FIG. 4. I-BEAMS IN PLACE FOR BATTLEDECK FLOOR

FIG. 5. STEEL PLATES IN PLACE READY FOR WELDING

General Electric Company

FIG. 6. CONTINUOUS AUTOMATIC ARC WELDING AT WORK

Structural Gypsum Corporation

FIG. 7. PRECAST GYPSUM FIREPROOFING SUSPENDED UNDER BEAMS AND GIRDER

flat sheets are continuous over the supports, increasing the strength of the construction and forming a series of air pockets as a third insulating medium. Purlin spacing up to 6′–0″. Mineral surface roofing. Thickness of corrugated sheets from ¼″ to 5/16″. Flat sheets from 3/16″ to ¼″. Combined weight of sheets from 4 to 8 pounds per square foot. Low maintenance cost. High salvage value. Heat and fire-resistant properties of Transite.

GYPSTEEL FLOOR AND CEILING CONSTRUCTION

Structural Gypsum Corporation

Standard structural rolled steel sections, or welded, open-web steel joists with Gypsteel precast floor slabs and suspended Gypsteel precast ceiling slabs. Slabs made of calcined gypsum with a small percentage wood planer chips. Approved for fully fireproofing construction for live loads up to 150 pounds by Building Departments of principal cities.

Ceiling slabs

2″ thick suspended underneath the steel floor members to form a flat ceiling and to fireproof the supporting steel. Slabs reinforced with ¼″ x 3⁄8″ flats running lengthwise and projecting from the end of the slabs. The slabs hung from the reinforcing by hangers attached to the steel. The beveled and rabbetted joints filled with grout.

Floor slabs

2½″ thick reinforced with 3/16″ cold-drawn wire rods projecting about 2½″. The projecting ends of opposite rods in abutting slabs tied together with a mechanical device forming a continuous reinforcing. The joints similar to those in the ceiling slabs filled with gypsum grout. Length of slabs 2′–6″.

Girder fireproofing

2″ thick reinforced soffit slabs.

Dead loads

Floor and ceiling slabs combined, 21 pounds per square foot.

STEEL PANEL CONSTRUCTIONS

BATTLEDECK STEEL FLOOR CONSTRUCTION

Sponsored by the American Institute of Steel Construction

(Figs. 4, 5, 6, 7)

I-beams 3″, 4″ or 5″ deep, spaced approximately 24″ apart, supporting steel plates which have their edges over the centerline of the beam. Except for extremely heavy loads 3/16″ or ¼″ plates 24″ wide are sufficient to meet building requirements. Automatic welding equipment traveling along the seam between the edges of the plates weld them together and at the same time weld them to the top flange of the beam. The result is a built-up T section with the plates

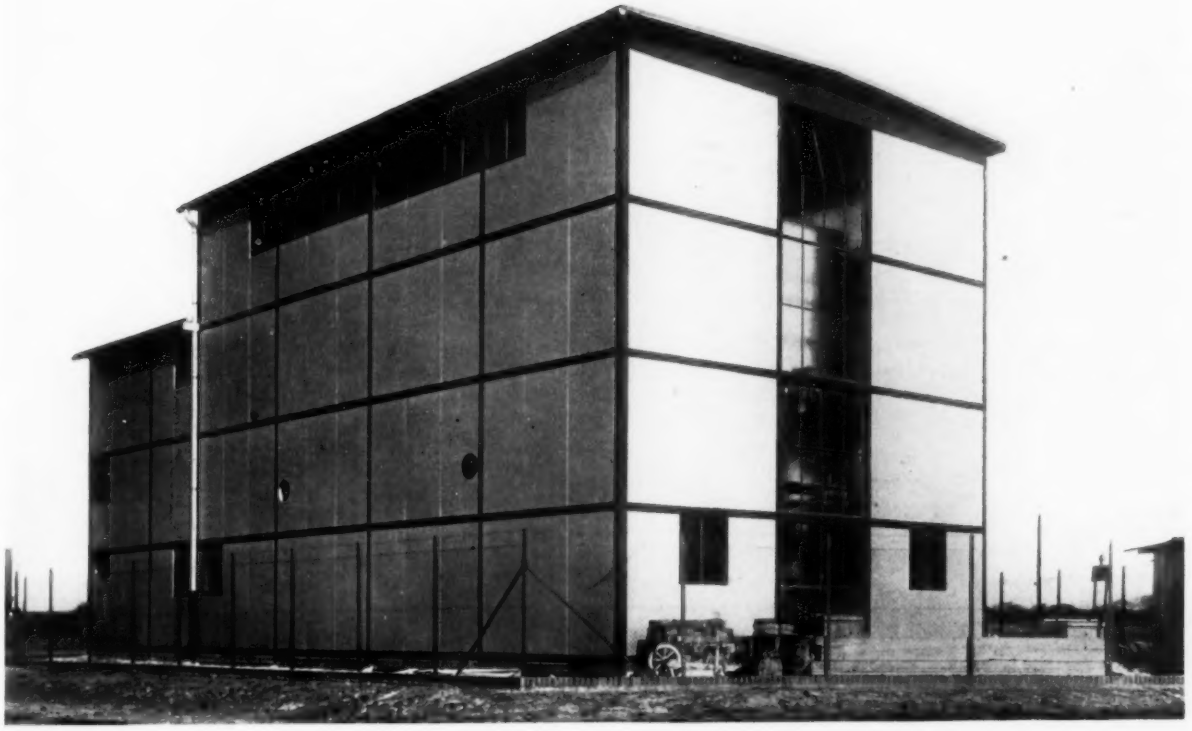


FIG. 8
COMBINATION STEEL FRAME AND STEEL LAMELLA CONSTRUCTION FOR GERMAN TRANSFORMER STATION. THE PLATES ARE ACTIVE IN CARRYING STRESSES, ELIMINATING WINDBRACING AND PERMITTING WIDER COLUMN SPACING

acting as the upper flange and the beam acting as the vertical part of the T. The weld being immediately over the center line of the beam provides a connection that is at the theoretically most efficient position. In construction it will be found necessary to weld the bottom flange of the I-beam to the shelf angle of the main girder in order to provide continuity or a fixed end bending moment. The actual amount of welding necessary to develop the strength of the T section is only about 25% to 40% of the length of the seam. Spotwelding has been used in recent constructions. Required fire protection by metal lath and plaster, or by precast blocks of fireproofing inserted or suspended on the lower flange of the small beams. Either type can be erected after the welding. The floor can be covered with cement, rubber tile, linoleum, cork, or left exposed.

Engineering data

By using a 3″ 5-7/10 pound I-beam spaced 24″ centers, and a 3/16″ plate, such a floor construction will carry a total load of 190 pounds per square foot on a 10-foot span with a deflection of 0.104″. The same floor will carry a total load of 85 pounds per square foot on a 15 foot span with a deflection of 0.235″. The weight of the steel work, including beams and plates, will be 10½ pounds per square foot. By a proper variation in the size of the beams and the space between them, together with the thickness of the plates, it is possible to develop a floor to meet almost any condition of loading with a dead-load saving of from 25% to 50% of present construction. Automatic traveling welding equipment is on the market that will weld the seam at the rate of approximately 90 feet per hour and at a cost estimated to be approximately 3c per linear foot.

Advantages

Elimination of excessive dead load. Reduced column and footing requirements. Decreased height of floor construction. Determination in advance of stresses in all parts of a floor which will recover 100% of its deflection due to live loads when these loads are removed. Erection under any weather conditions. The construction generates a solid steel deck which will act as a girder to prevent any twisting distortion to the building when subjected to wind or earthquake. The floor construction can be carried out into the walls to provide spandrel construction to support the outside walls. It will provide a working floor for other trades and in many places eliminate the necessity of temporary planked floors.

FIGS. 9, 10, 11
HOLORIB DECKS

HOLORIB DECKS

Detroit Steel Products

(Figs. 9, 10, 11)

Steel roof, floor and wall plates fabricated from copperbearing or galvanized steel sheets reinforced by self-contained triangular ribs rolled into the sheet longitudinally; the plates welded, riveted or anchored with specially formed anchor clips to the purlins or joists. The sheets dovetail and interlock ends and sides. Spacing of purlins or joists from 4 feet to 8′–6″. Gauge of sheets from 24 to 18. Roof insulation with pressure-resisting types of insulation full-mopped with hot asphalt. Final waterproofing with built-up felts. For steep surfaces anchoring of insulation with self-expanding nails that do not penetrate the sheet. Can be used as floor with and without concrete. The plates can be made of aluminum or lead coated.

Engineering data

COMPARATIVE ROOF WEIGHTS

	lbs. per sq. ft.
Waterproof covering	1.5
1-in. insulation	1.5
Steel deck	1.6 to 2.9
Total approximately	5 lb.

THERMAL CONDUCTIVITY OF HOLORIB

The following table gives the thermal conductivity of Holorib roofs, including in each case a standard composition roofing:

Holorib without insulation	0.781 B.t.u.
Holorib and ½″ insulation	0.358 B.t.u.
Holorib and 1″ insulation	0.232 B.t.u.
Holorib and 1½″ insulation	0.172 B.t.u.
Holorib and 2″ insulation	0.136 B.t.u.

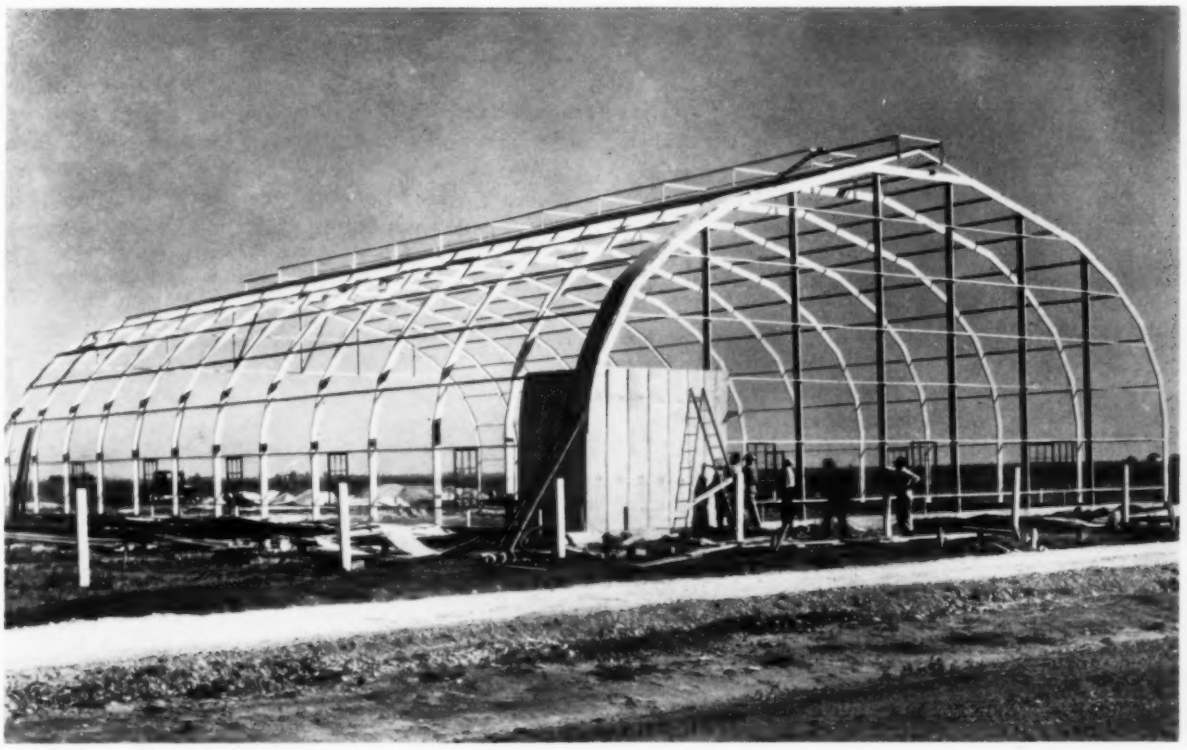
Insulation referred to above may consist of such pressure-resisting materials as cork, Celotex, Insulite, J-M Board, etc. The values of the thermal conductivity are taken from data published by the American Society of Heating and Ventilating Engineers Guide (1930 Edition).

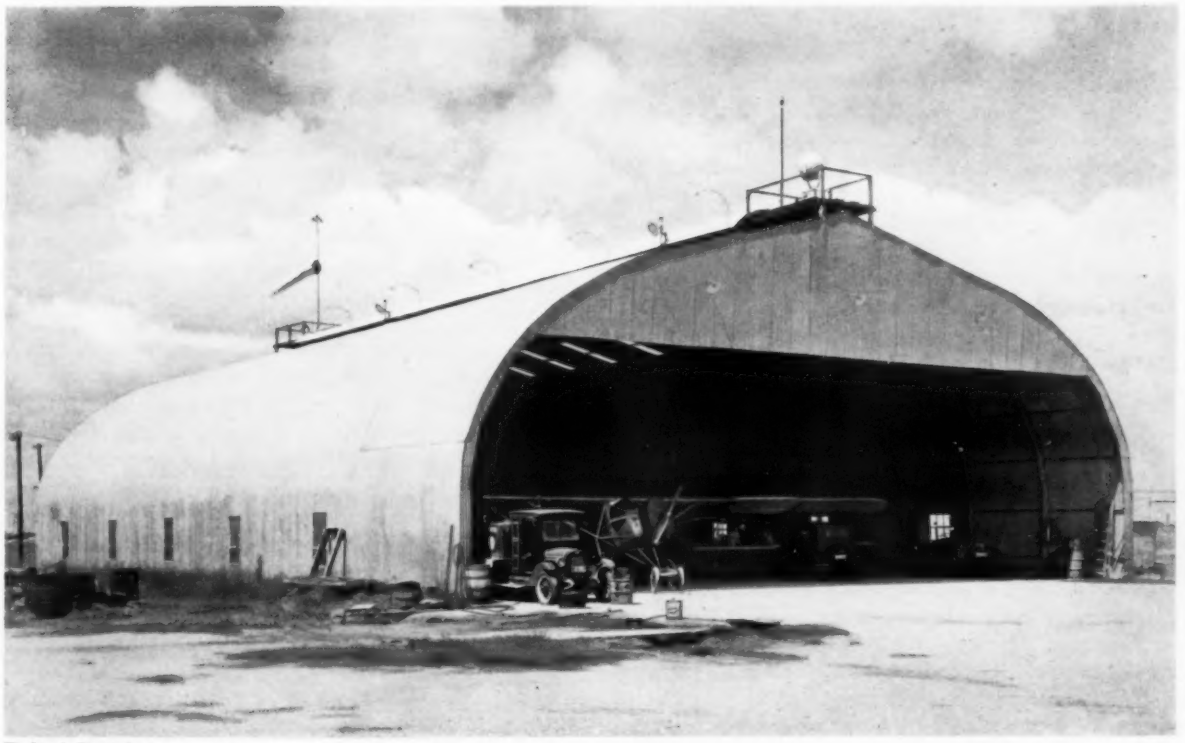
Cost data

24-gauge Holorib over bar joists, with ½″ insulation and a four-ply built-up roof, will cost from 30c to 32c per square foot, while 20-gauge Holorib with the same type of insulation will cost from 31c to 34c per square foot. An extra ½″ of insulation will run this cost up to 37c to 41c per square foot.

Advantages

Quickly erected in any weather. Negligible contraction and expansion. Minumum maintenance. Elimination of excessive dead load. Watertight. Rigid self-adjusting foundation for insulation and waterproofing.





The Lincoln Electric Company

FIGS. 12, 13

HANGAR AT HOUSTON, TEXAS. ARC WELDED STRUCTURAL CHANNELS. CORRUGATED SHEET IRON. HANGAR WITHSTOOD A CYCLONE THAT DEMOLISHED AN ADJOINING BRICK HANGAR

LOW COST PRODUCTION OF WROUGHT IRON

THE ASTON PROCESS (*)

Production of wrought iron at lower cost and increased tonnage has been developed by the A. M. Byers Company, Pittsburgh, Pa.

The even dissemination of silicate slag throughout the pure iron is accomplished by pouring refined iron at high temperature into a bath of silicate slag at a lower temperature. Mixing in this way permits all other steps of the process to be accomplished as separate units similar to those followed in the making of steel. The molten iron carries dissolved gases in large amounts. When poured into the slag, the metal is continuously solidified, and the gases are released, causing an infinite number of small explosions which disintegrate the iron into small globules. These settle to the bottom of the cup, and form a spongy mass intermingled with the liquid slag. The surplus liquid slag is poured off, and the spongy ball of metal at a white heat is put through an electric press and compacted into blooms suitable for rolling. Instead of the 200 to 300-pound blooms possible in hand puddling, the new process can produce blooms weighing three tons or more, offering the advantages of more economical rolling. Every step in the process is subject to scientific analysis and mechanical control.

LIGHTWEIGHT METAL

ALUMINUM

Approximately 3 per cent of the new aluminum produced by the Aluminum Company of America finds its way into the building industry.

Curtain type doors installed in a roundhouse for the Norfolk and Western Railroad weigh 323 pounds as opposed to 1.080 pounds for galvanized steel doors of similar size. The doors are operated by means of a hand chain and gears. In the case of the aluminum doors, the gears are in the ratio of 6.8 to 1; while in the case of the galvanized steel doors, this ratio is 21 to 1. The aluminum doors are resistant to coal gases found in the atmosphere around a roundhouse.

The initial cost of structural aluminum shapes is about 2.6 times as great as steel beams of equal strength. The greater initial cost may in many cases be offset by the reduction in dead weight of the building, reduced cost of haulage, erection and maintenance, and by the advantages of the specific properties of aluminum. Structural aluminum shapes are employed in oil fields and refineries because of the resistance of the metal to hydrogen sulphide and in rubber factories because of its resistance to sulphur. The relatively high reflectivity of aluminum for ultra-violet radiation and heat radiation indicates a number of possible uses of this metal and of aluminum foil and paint.

*Executives Service Bulletin, Metropolitan Life Insurance Co.

LIGHTWEIGHT CONCRETE

AERATED CONCRETE

Trade names: *Aerocrete*, *Gasconcrete*, *Bubblestone*. Made by processes depending upon the introduction of chemicals to generate gases which cause the mass to rise much like baker's dough. One method is to mix portland cement, hydrated lime, and a small amount of finely powdered aluminum and lightweight aggregate, usually from 1 to 3 parts by weight. When the mass is tempered with water, hydrogen is liberated and the mass rises.

Weight: generally between 40 to 50 pounds per cubic foot.

Compressive strength: about 500 pounds per square inch at the usual weight.

Coefficient of thermal conductivity: 0.17 B.t.u. as compared with the values of 0.45 for ordinary concrete and 0.03 for cork.

Fireproof. Small absorption. Can be worked with woodworking tools, sawed, grooved and spiked. Used in precast units or cast in place.

HAYDITE CONCRETE

Haydite

A lightweight, heat-treated clay aggregate. The raw material consists of ordinary clay or shale crushed to a maximum size of one-inch lumps. The natural moisture content of the shale or clay as it comes from the pit is retained. The crushed material is charged into a rotary kiln. As the lumps roll down the kiln they are preheated at a temperature of approximately 800°, which vitrifies a thin layer of the outside of each particle, thus confining the combustion gases resulting from subsequent burning of the inner portion of the raw material. When the preheated particles reach the burning zone they are subjected to intense heat from a second fire nozzle, which brings them to incipient fusion, approximately 2000°. At this point the vitrified outer layer is softened and the sudden rise in temperature causes the confined gases to expand, puffing out the lumps to 2½ times their original size. The expanded material partially fuses forming porous clinkers composed of minute cells each surrounded by a wall of vitrified clay. The cooled clinker is crushed and screened into sizes of standard aggregates.

Weight: The fine grade, approximately 1300 pounds per cubic yard; the coarse grade, approximately 1150 pounds per cubic yard.

Haydite concrete

Concrete using Haydite as aggregate weighs 100 pounds per cubic foot as compared with 150 pounds per cubic foot for concrete made from standard aggregates. It has the strength of standard concrete. Classified as approved fire-resistant material. Monolithic construction, precast slabs and blocks.

RIGID AND SEMI-RIGID INSULATING BOARD

SUMMARY OF DATA (*)

Name of Product	Name of Manufacturer	Plant Location	Raw Material	Strength		Conductivity †
				Modulus of Rupture*	Tensile Strength*	
				Lbs. per sq. in.	Lbs. per sq. in.	
Maizewood	Maizewood Products Corp.	Dubuque, Iowa	Cornstalks	505	204	0.372 to 0.408
Insoboard	Stewart Insoboard Co.	St. Joseph, Mo.	Wheat Straw	352	340	0.324
Celotex	Celotex Co.	New Orleans, La. (Marrera, La.)	Sugar Cane Bagasse	338	292	0.329 to 0.461
Flaxlinum	Flaxlinum Co.	St. Paul, Minn.	Flax Straw	...	33	0.31
Fibrofelt	Union Fiber Co.	Winona, Minn.	Flax Straw	...	...	.....
Insulite	Insulite Co.	International Falls, Minn.	Wood Pulp Tailings	569	208	0.339 to 0.440
Nu-Wood	Weyerhauser	Cloquet, Minn.	Wood Waste	...	...	.....
Masonite	Mason Fiber Co.	Laurel, Miss.	Wood Waste	386	212	0.328 to 0.543
Firtex	Firtex Insulation Board Co.	St. Helens, Ore.	Wood Waste	...	...	.....
Maftex	McAndrews and Forbes		Spent Licorice Root	...	...	.....

*Averages. †B.t.u. per sq. ft. per 1° F. for 1 hr. per 1 in. thickness. These values vary considerably.

PLASTICS

LUMARITH MOLDING MATERIAL

Celluloid Corporation, New York

A cellulose acetate colloided with suitable plasticizers, pigments and solvents. Furnished in slabs, chips or powder ready for molding by heat and pressure. Scrap and flash from the mold is reworkable, eliminating waste. Manufactured in sheets, rods and tubes. Furnished in any color, opaque or transparent. Transparent products claimed to be partially transparent to ultra-violet radiation. Hard, normal or soft qualities. Non-inflammable. High electrical insulation.

Working properties

Articles made from Lumarith molding material may be worked by any of the following mechanical operations: sawing, machining, polishing, cementing, drilling, tapping, threading, etching, stamping, engraving.

Cost

Molding material about $1.00 per pound. Manufactured products about $2.00 per pound.

Physical and chemical properties

	Transparent	Pigmented
Specific Gravity	1.29	1.56
Density, oz. per cu. in.	0.745	0.90
Specific Volume, cu. in. per lb.	21.5	17.8
Ultimate Tensile Strength, lbs. per sq. in.	2800–3600	3000–4200
Compressive Strength, lbs. per sq. in.	4000	11.000
Transverse Strength, lbs. per sq. in.	6300	7000
Impact Strength—Charpy cycles, ft. lbs. per sq. in.	3.2	2.2
Brinell Hardness—10kg. load 2.5 mm. Ball. —1 min. duration, kg. per sq. mm.	7–11.5	7–16
Thermal Expansion, in. per in. per °C.	0.000156	0.000102
Thermal Conductivity—cal. per cm. —per sec. per °C	0.00047	0.00054
Softening Temp., — °F.	140-150	160-180
Water Absorption in 48 hrs. (room temperature), —%	1.9	1.4
Light Resistance	Practically no discoloration	
Chemical and Solvent Action of Various Reagents on Lumarith Materials		
(a) Alcohols, such as methyl, ethyl, butyl	Superficial spotting	
(b) Vegetable oils, such as castor oil	No effect	
(c) Mineral oils	No effect	
(d) Strong mineral acids (H_2SO_4, HNO_3,)	Decomposed	
(e) Strong alkalies	Decomposed	

Present applications

Auto and airplane parts. Containers. Cutlery handles. Electrical fittings. Glass substitutes. Hardware. Radio cabinets and parts. Toiletware. Bathroom accessories. Display fixtures. Office equipment. Can be used for furniture and wall treatment.

(*) Compiled for THE ARCHITECTURAL RECORD by L. K. Arnold, Assistant Chemical Engineer, Engineering Experiment Station, Iowa State College.

REMOTE CONTROL

RADIO CONTROL FOR GARAGE DOOR OPERATORS

Barber-Coleman Company, Rockford, Ill.

Equipment

Transmitter installed in the automobile consisting of timer fastened on the instrument board, spark coil enclosed in watertight box clamped on the frame and transmitting antenna suspended under the car. Power for the transmitter drawn from car battery. Receiving unit inside the garage controlled from the car by means of radio impulses and adjusted to operate only at certain series of impulses so that no car but the proper one can open the door. Motor-driven operator made in types adapted to folding, swinging, sliding and overhead doors.

Operation

The driver pulls a knob on the instrument board as he approaches the garage. The garage door opens, the garage lights are lighted, and he drives in without stopping or getting out of the car. The door may be closed and the garage lights extinguished from the car. Lights and door can be operated independently of each other and of the radio control by means of wall switches in the garage or in the house. The operator stops the door at the end of the closing stroke so the door closes completely without slamming. When the door is closed, the operator locks it automatically. A safety device automatically disconnects the operator drive from the door when the latter encounters an obstruction. In case power supply is cut off, the door can be unlocked, opened or closed and locked by hand without adjustment.

Cost

Transmitter and receiver installed—$155.00. Cost of operator varies with type of door, from $160 to $325 installed.

AUTOMATIC CONTROL

PHOTO-ELECTRIC RELAY

General Electric Company

A device to control electrically operated equipment in response to an increase or decrease in the intensity of light.

Operation

Controlling element: the electron discharge photo-electric tube. With voltage of proper magnitude applied between the two elements, the current it passes is proportional to the amount of light shining on it. The current is amplified by a vacuum tube; a sensitive relay is connected in the plate circuit of the tube and is energized or de-energized in accordance with the amount of light on the photo-electric tube. The contacts of the relay control the coil circuit of a contactor. When the sensitive relay in the plate circuit of the amplifier is energized, it will first open the normally closed contacts and then close the normally open contacts. The relay therefore either makes or breaks the coil circuit of the contactor. In operation the relay is practically instantaneous.

Application

1. OPERATION OF MAGNETIC TYPE COUNTER

a. Counting items such as bags or boxes of material.

b. Counting traffic either pedestrian or automotive passing a definite point.

2. CONTROL OF MECHANISMS

a. Turning on and off illumination of streets, store windows and electric signs, depending on the intensity of outside light in cases where time switches lack flexibility.

b. Automatic door operators. A ray of light focused on a photo-electric tube passes in front of the door. The tube and the light are placed several feet from the door, and as the person approaches, his body interrupts the light ray directed at the tube. When the ray is interrupted, a hydraulic door opener is set to work through the agency of the photo-electric relay. The length of time during which the door is held open is variable by adjusting the control. Especially adapted for doors to restaurant kitchens, garages, etc.

c. Fire alarm. Placed over furnaces, registers, space heaters, etc., a puff of smoke will put the relay in action.

d. Burglar alarm. A special type sensitive to beams in the invisible end of the spectrum.

Many additional possibilities are open for consideration. Color filters make the relay responsive only to light of certain hues. Light louvres will shield the tube from all light save beams coming from certain directions.

THE THYRATRON TUBE

General Electric Company

A mercury arc rectifier with grid control. The power output to a given load on the rectified current circuit depends on the phase relation of the grid to the anode voltage. By shifting the phase of the grid voltage form in phase to 180° lagging the load can be varied from maximum to zero.

Application

CONTROL OF MOBILE LIGHTING

Application of a selsyn control unit ("Selsyn" is the *General Electric Company's* trade name for self-synchronous motors) and a thyratron tube unit takes the place of the present type of control using rheostat

elements to vary the circuit voltage. The selsyn unit gives simultaneous control of any number of circuits while the thyratron provides uninterrupted voltage variation in the lighting circuit and gradual transition from one setting to another. The equipment is especially adapted to theatre and auditorium lighting, floodlighting of buildings, interior lighting, colorama, show windows and signs.

CONTROL OF AUTOMATIC DOOR OPENER

A metal plate with fixed electrical capacity is placed at the side of the door. When this fixed capacity is unbalanced by the application of variable capacity, such as tapping by a person's hand, a series of four thyratrons is set into action, each with a particular duty in an electrical circuit. The final thyratron operates a relay which releases a lock and starts a motor on the hydraulic door-opener. The circuit may be set for any sequence of contacts or touches, and will respond only to the sequence for which it is set. If, for example, "52" is the secret code, the metal plate is tapped lightly five times, followed by a pause of a few seconds, and then tapped twice. The thyratrons then function and the door swings open.

VACUUM TUBE ELEVATOR CONTROL SYSTEM

General Electric Company

The use of a three-element vacuum tube, known as a pliotron, in the automatic leveling of elevator cars is based on the increase of plate current when the tube changes from an oscillating to a non-oscillating condition. A suitable number of tubes are mounted on each elevator car. These tubes are normally in oscillation. The motion of the car as it approaches a floor level is made to stop the oscillation of the tubes, thus actuating relays. The relays govern control circuits which slow up the car and stop it at the correct position. The car is controlled running in either direction. In operation the elevator operator throws his car switch to the "OFF" position as he approaches the floor at which it is desired to stop. The car will be made to stop at the correct level without any attempt or work on the part of the operator.

Another application of the pliotron tube to elevator operation makes it unnecessary for the operator to watch his position in the hatchway. Devices similar to those used in automatic leveling are employed, and in addition a signaling equipment consisting of push buttons, lights and a bell is used. With this system the operator does not need to know where he is in the hatchway, and as long as he pushes the button for each floor called and shuts off his car switch each time the light flashes or the bell rings, he knows that he will make the required stop.

ARTIFICIAL ULTRA-VIOLET RADIATION

SUN-LAMP UNIT

Westinghouse Lamp Company

The lamp for this unit, the type S-1, is made in a bulb of ultra-violet transmitting glass (Corex-D). The bulb contains argon gas and a small quantity of purified mercury. The lead-in wires terminate in a pair of tungsten electrodes across which is shunted a V-shaped coil of tungsten filament. The required voltage regulation is automatically accomplished by a specially designed transformer housed in the base of the unit. The heat from the filament vaporizes some of the mercury in the bulb. The presence of this mercury gives rise to the ultra-violet radiation, while the filament and the hot tungsten electrodes radiate light and heat. The reflector is of special matte-finish aluminum selected on account of its ultra-violet reflecting properties. The lamp is operated on a transformer, and can only be used on 100–125 volts, 50–60 cycle A.C. The bulb will last several hundred hours. The price of the unit is $69.50. Bulbs for renewal, $7.50.

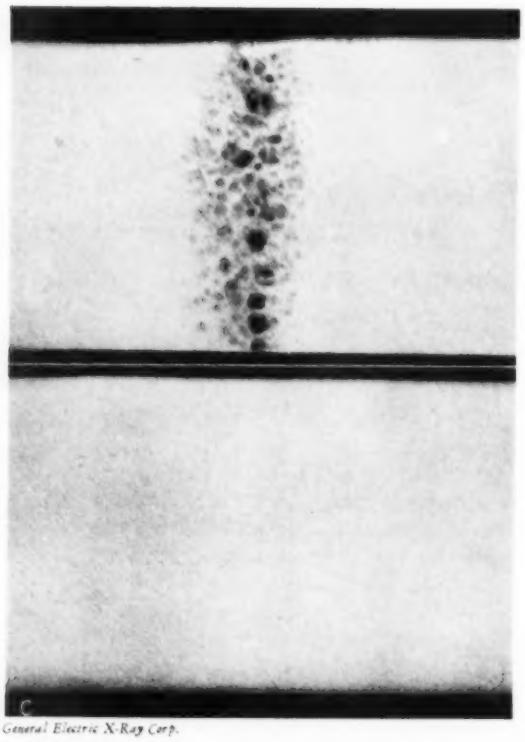
TUNGSTEN FILAMENT LAMP

Westinghouse Lamp Company

The S-1 Lamp unit is limited largely for home service in the general maintenance of health and cannot be recommended unqualified for general lighting installation. In order to obtain facts on installation of general interior lighting where a mild ultra-violet component to the illumination might be thought desirable, the following two types of tungsten filament lamp in ultra-violet transmitting bulbs have been made available by Westinghouse Lamp Co.:

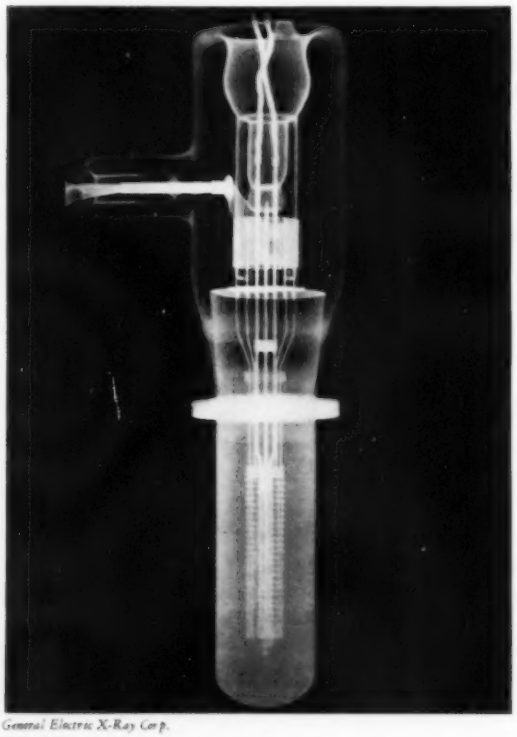
Watts	Voltage	Finish	Life Hours	Price
60	110–115–120	Inside Frost	300	$2.00
500	110–115–120	Inside Frost	300	$4.50

Due to the high temperature at which the filament operates, there is a certain amount of ultra-violet radiation from these lamps which does not exist in the case of the regular Mazda lamp in the 1000-hour class and in the regular glass bulb. These two lamps may be operated in any standard socket and on either A.C. or D.C. No claims are made at this time as to their performance or desirability. The lamps are suggested for experimental work chiefly. The ultra-violet emitted is so mild that even for continued periods of human bodily exposure, there is little likelihood of harm resulting. Reflectors of aluminum or chromium are recommended. Regular glass-enclosing globes are opaque to ultra-violet.



General Electric X-Ray Corp.

FIG. 14
RADIOGRAPHS OF TWO WELDS MADE BY THE SAME INDIVIDUAL, WITH TWO DIFFERENT WELDING METHODS. THE PERFECT WELD (LOWER) SHOWS THAT WITH A GIVEN METHOD ONE MAY BECOME SKILLED WHEN THE X-RAY IS USED AS A MEANS OF DEVELOPING A CORRECT TECHNIC



General Electric X-Ray Corp.

FIG. 15
BROADCASTING TUBE INSPECTED WITH X-RAYS AFTER ASSEMBLY

PROCEDURE CONTROL

INDUSTRIAL APPLICATION OF THE X-RAY

(Figs. 14, 15)

Reports of investigations in the field of metal radiography indicate that X-ray tests are very useful in the examination of metal castings, forging, welding and assemblies. Most of the microscopic defects in metal can be revealed by X-rays. Those which are most readily detected are shrinks, blowholes, pinholes, porosities and seggregates. Fine cracks and laminations in forgings can be revealed easily, provided the X-rays pass through the piece nearly parallel to the crack or lamination. Collateral tensile, impact, and fatigue tests indicate that when welds are free from defects as shown by X-ray pictures, they have the best physical properties.

NOISE CONTROL

NOISE-EXCLUDING DEVICE

Announcement has been made of the invention of another silencing device (the *Maxim Window Silencer*) to prevent noise entering rooms, while at the same time providing sufficient ventilation. It is intended especially for use in hospitals, hotels and offices. The installation of this unit is made by opening the window, slipping in the silencing unit, which includes the patented anti-noise device and an electric ventilating fan to draw in and expel air. The window is then closed so far as possible holding the unit in place. It can be adjusted to fit window frames of any size.

COMMUNICATION

RADIO

Many hotels and apartments are now being constructed with provisions made for installation of radio. A hotel installation generally consists of three or more receivers with channels from each terminating in jacks in the various rooms. The guests merely have to plug the loud speaker furnished into any one of the jacks, giving a choice of three or more programs. An apartment installation generally consists of several antennae installations with channels to the various apartments.

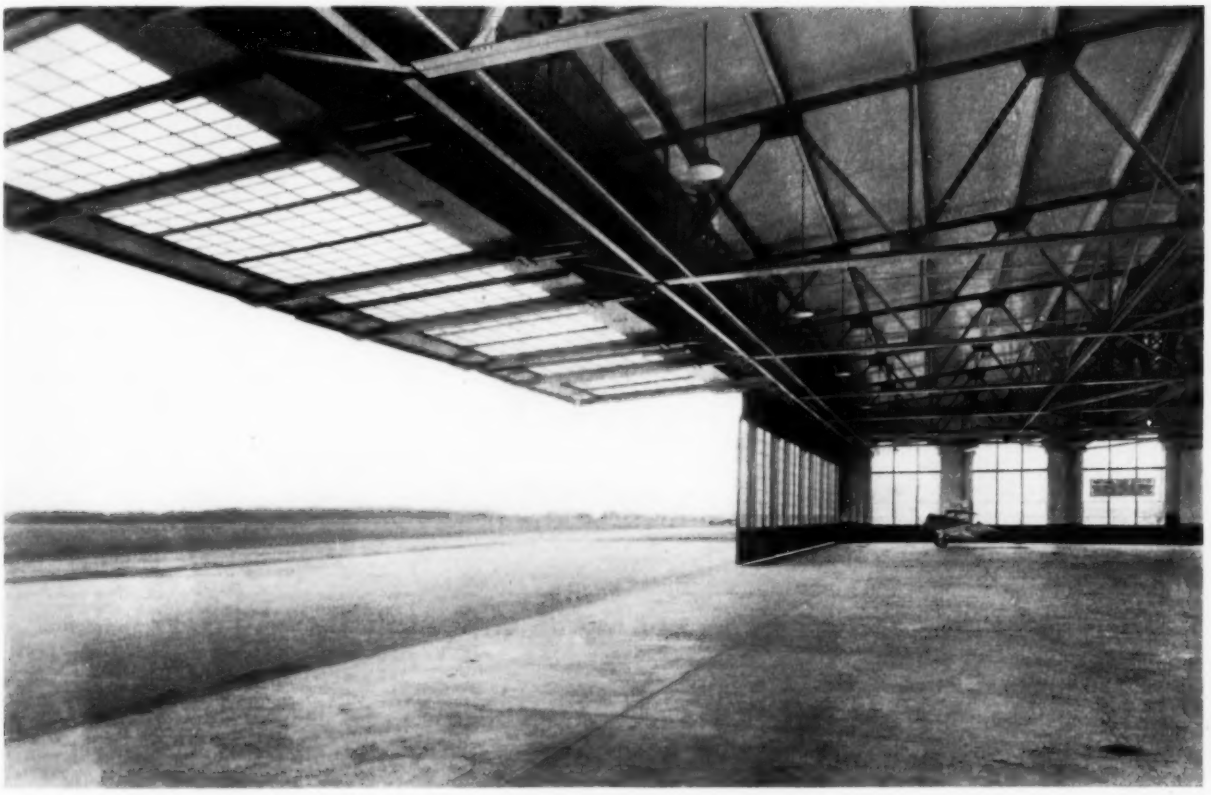
PORTABLE MOTION PICTURE AND SOUND EQUIPMENT

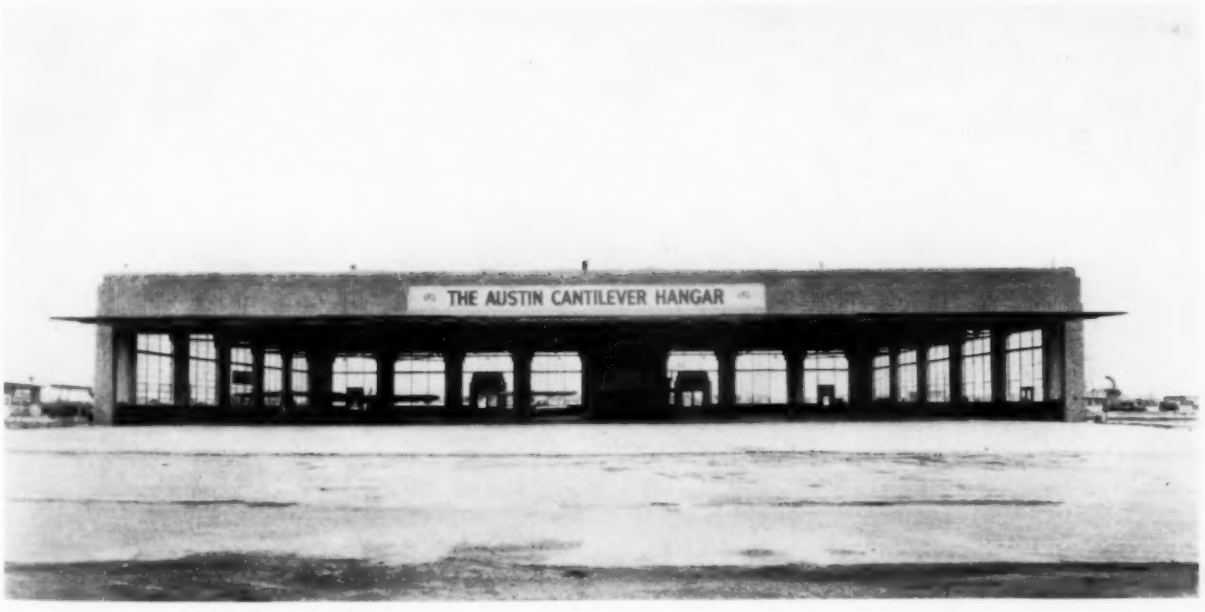
Several portable sound-reproducing equipments are now on the market. These reproducers can be obtained in trunks in which they can be packed away and shipped after use, or in conjunction with a movable stand which can be rolled in or out of the room. In the former case the necessary cords are furnished to connect the amplifier equipment with the horns, while in the latter the wiring and conduit are generally incorporated in the building construction.

K. LONBERG-HOLM

NOTES ON DRAFTING AND DESIGN

CANOPY TYPE HANGAR DOORS





AIRPORT, CLEVELAND, THE AUSTIN COMPANY, ENGINEERS AND BUILDERS

AIRPORT, CLEVELAND, THE AUSTIN COMPANY, ENGINEERS AND BUILDERS

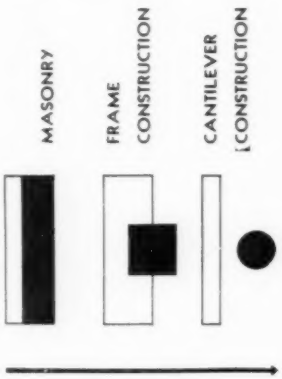
Hangar of cantilever type construction with a single supporting column in the middle. Floor space 200 x 120 feet. The canopy type doors extend the entire length of the hangar on one side. The ceiling clearance under the doors and inside the building is 20 feet. The doors are divided into 8 sections each 25 feet long and can be operated as an entire unit or each unit separately. They are operated by two large lead screws, one at each end, which are rotated through beveled gears by means of a special 5 HP "Linc-Weld" Motor (Lincoln Electric Co.). The doors can be started, stopped or reversed from any point between the open and closed position. Automatic stop comes into operation when the doors have reached either the completely open or completely closed position. When closed the doors form a solid wall, except for two small pass doors, one in each end section.

SUPPORTS AND WALLS

EVOLUTION OF WALL CONSTRUCTION

SUPPORT

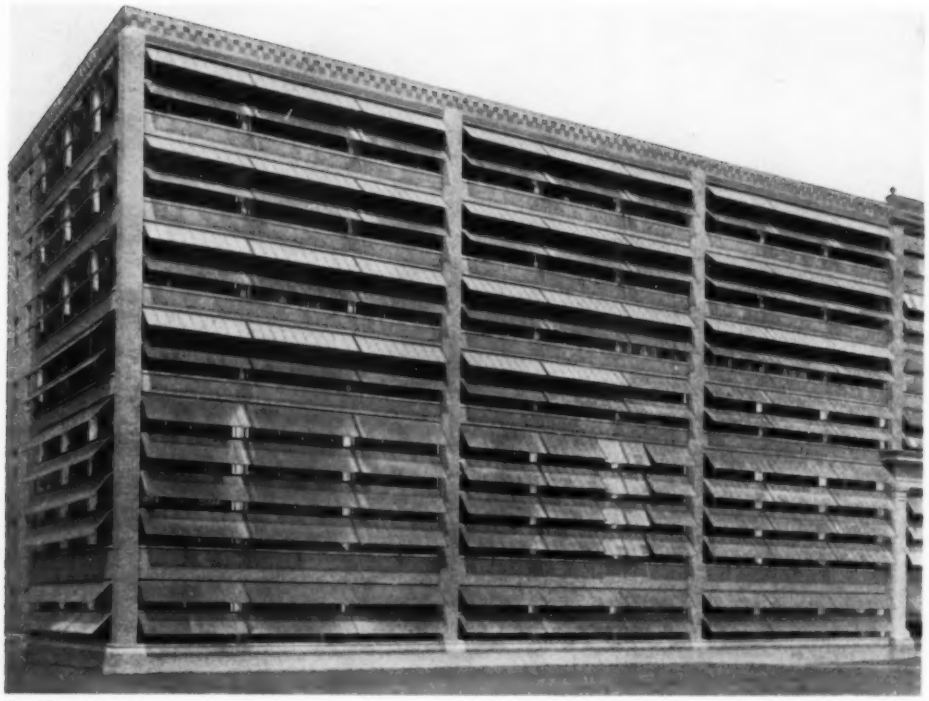
ENCLOSURE



W. D. Morgan

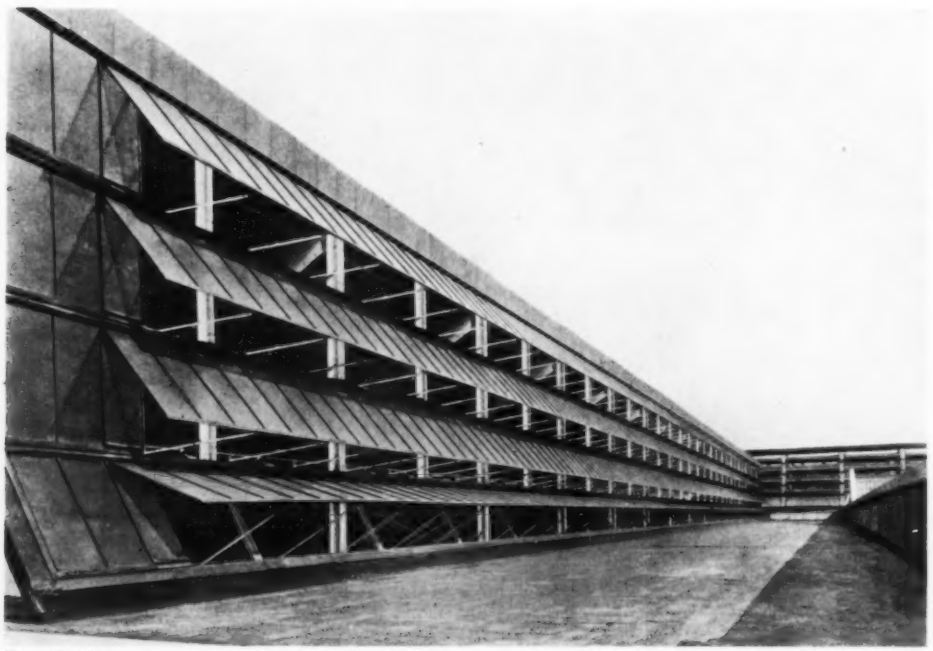
CENTRAL MANUFACTURING DISTRICT, LOS ANGELES

The masonry wall serves two functions: support and protection. Frame construction leads to segregation of supporting members and enclosing walls and to beginning of spatial separation. Use of steel and reinforced concrete reduces the size and the number of vertical supports. In the buildings shown above no attempts were made by the designers to disguise the specific character of the construction by emphasizing the vertical supports to suggest masonry construction.



David Lupton's Sons Co

FIRESTONE TIRE AND RUBBER COMPANY, AKRON, OHIO



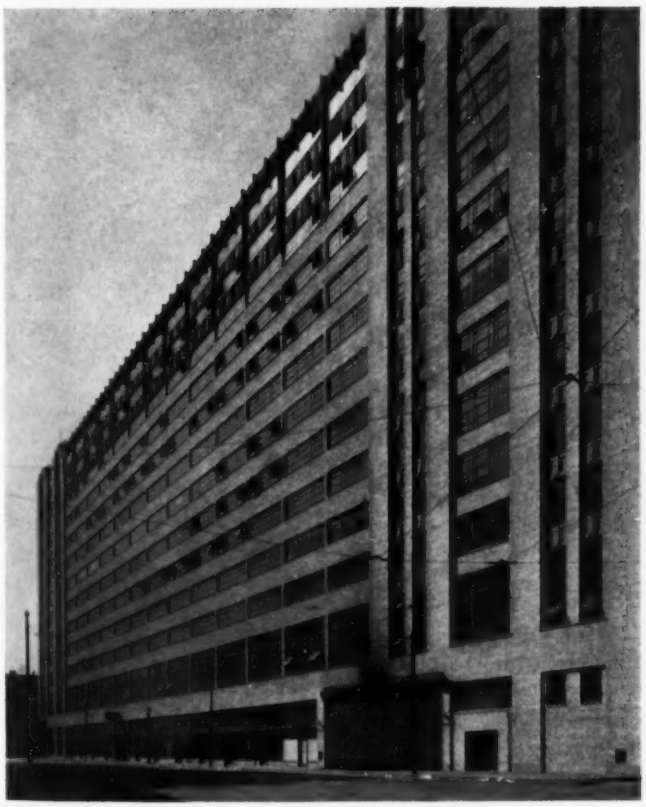
Truscon Steel Co.

MONITORS, FORD MOTOR COMPANY, RIVER ROUGE

Differentiation of function, material and erection leads to spatial separation. The enclosing walls are designed to meet their specific purpose with a minimum of means. The spatial separation of individual units gives freedom in erection and flexibility in layout and operation. The supporting members are reduced to a minimum.

YARD ELEVATION

8" thick reinforced concrete spandrel, unplastered. Net unit cost: 63c per square foot.



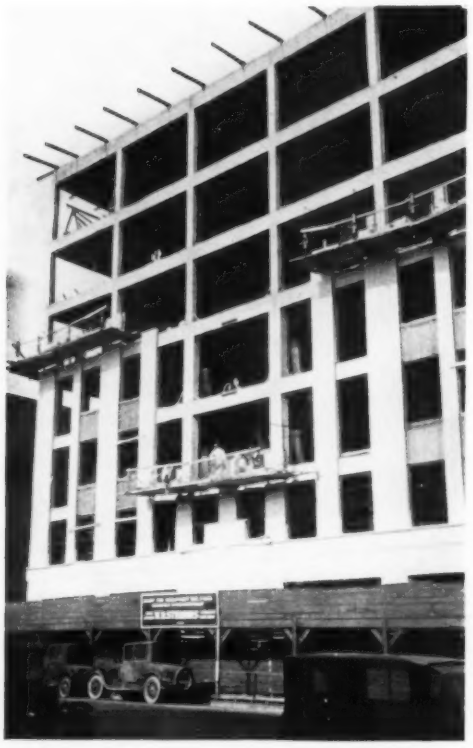
STREET ELEVATION

12" thick brick wall of 4" face brick and 8" backing brick unplastered. Net unit cost: $1.19 per square foot.

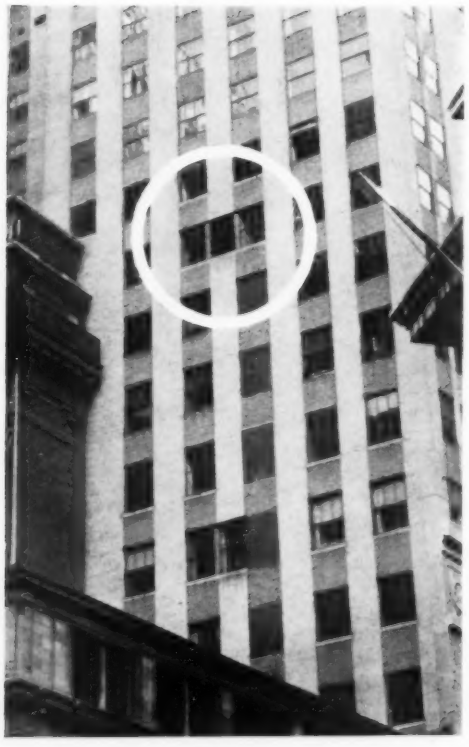
Paul J. Weber

NORTH STATION INDUSTRIAL BUILDING, BOSTON
TURNER CONSTRUCTION COMPANY

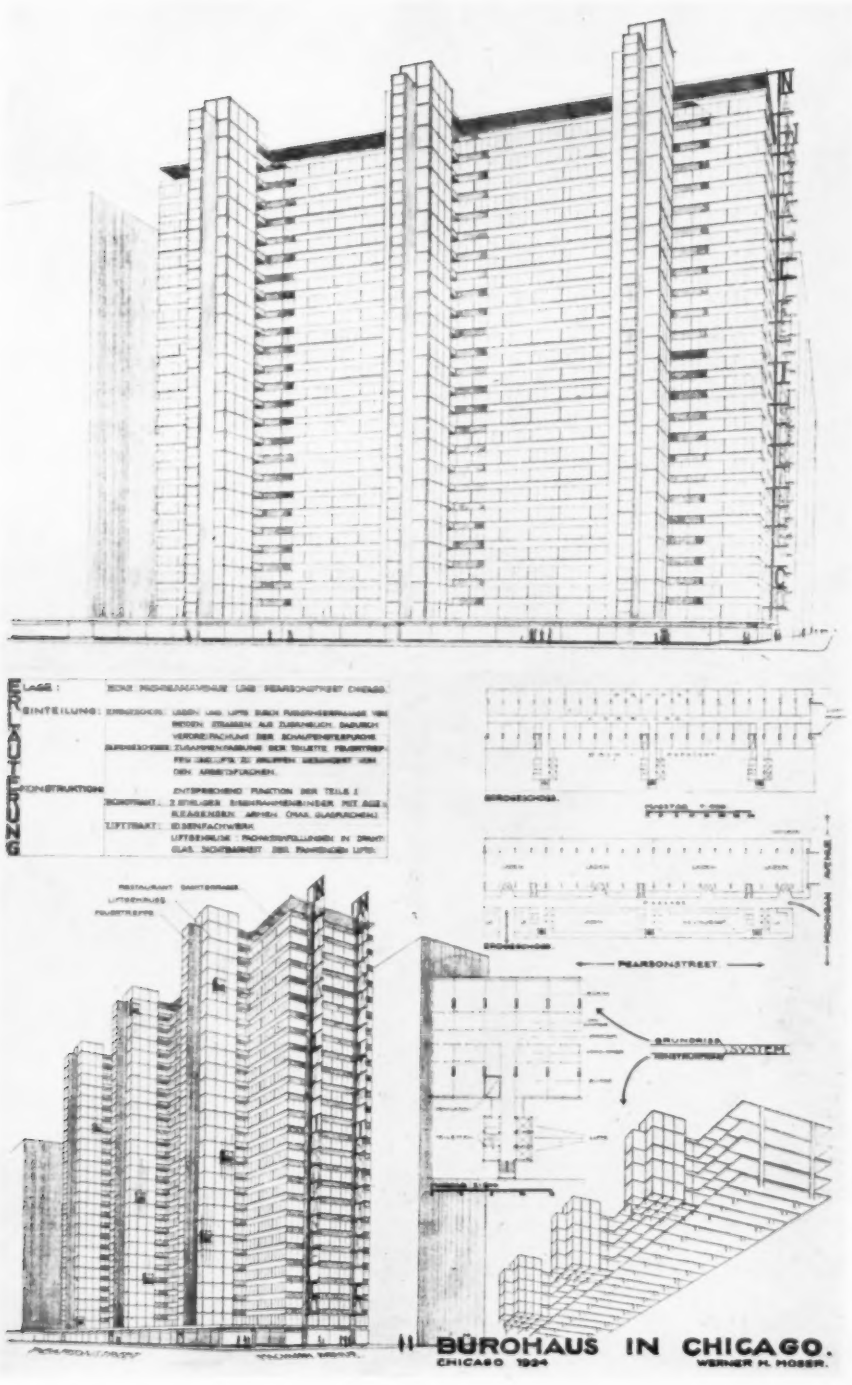
Support and floor construction the same on both sides. The arbitrary introduction of false masonry construction has increased cost, weight and thickness of wall.



National Steel Fabric Co.



Vertical obstructions become architectural features. Tons of masonry piled on shelfangles defy the very purpose of the zoning law by shutting out the daylight. The achievements of the engineer neutralized by the designer.



DESIGN FOR OFFICE BUILDING, CHICAGO, WERNER M. MOSER, ARCHITECT

The cantilevered steel construction permits continuous openings for light and vision and a controlled flexible layout of the office units. The elevator shafts, enclosed in steel and wired glass construction, and the service units are separated from the office part. The building is easily read. Separate functions are separated in space, material and construction, permitting a rational solution of each individual problem.

DESIGN FOR DEPARTMENT STORE, BERLIN
MIES VAN DER ROHE, ARCHITECT

No excess load. A curtain of metal and glass hung from floor to floor.

TECHNICAL NEWS AND RESEARCH

NEWSPAPERS AND PUBLISHING PLANTS

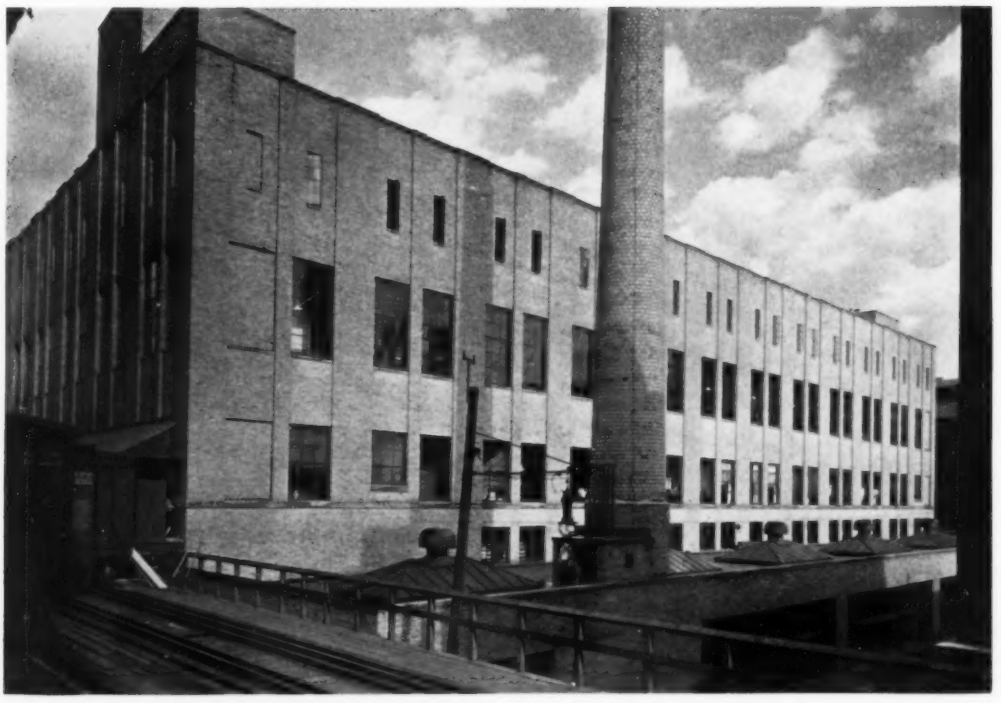
BY

C. THEODORE LARSON

Anderson

KANSAS CITY STAR • CITY ROOM, NUCLEUS OF THE NEWSPAPER PLANT

Many architects, engineers, editors, publishers and craftsmen have been consulted in the preparation of this article. Appreciation is expressed for their assistance and in particular for valuable data contributed by Frank D. Chase, Inc., engineers and architects; Lockwood Greene Engineers, Inc.; Laurance B. Siegfried, editor The American Printer; James William Thomas, architect; and Samuel P. Weston, newspaper consultant. Others who have assisted include Bonsack and Pearce, architects; Samuel Hannaford and Sons, architects; Milton F. Baldwin, editor The Inland Printer; George H. Carter, Public Printer of the United States; E. P. Hulse, A. S. M. E., Printing Industries Division; F. M. Feiker, Associated Business Papers; F. J. Kaysel; William Edwin Rudge; and several score newspapers and publishing concerns throughout the country.



PITTSBURGH PRESS, HOWELL AND THOMAS, ARCHITECTS

The element of time determines the value of the newspaper site. Traffic movements and population distribution must be considered for speedy delivery. A railroad siding expedites the receiving of paper and other materials.

PUBLISHING PLANTS:
NEWSPAPERS AND PRINTING PLANTS

The publishing plant commands attention as an economically important and technically complicated building type. The printing industry ranks fourth in American manufacturing in value of products and sixth in number of wage-earners employed.* Satisfactory accommodations for the workmen and direct planning are imperative needs.

No attempt is made in this article to list the space requirements of personnel or equipment since these vary with each plant and are always changing. Plants themselves show changes in nature of product. Printing of daily newspapers in color is heralded for the very near future. A recent magazine article notes that there is a reading machine in Germany which picks up the reflected light from the page and translates the image into sounds. It is now used as an aid to the blind, but the prediction is made that before 1940 we, too, may be listening to it as it mumbles the morning paper.

In view of rapid changes in contemporary printing methods, it is clear that a study of this building type, to have any permanent value, must concern *fundamental* factors. *The problem of the publishing plant is not to make the plant fit a building but to construct a building to fit the requirements, general as well as specific.*

CLASSIFICATIONS

Publishing plants have three classifications, based on the determinants of character of product and the element of time:

1. Newspapers

The function of the newspaper is to supply news to the community. News is a vendible commodity—information. Information comprises many facts: *immediate happenings*, such as political and governmental activity, catastrophes, market reports, sports, social events, and *educational features*, ranging from editorials and advice to the lovelorn to a miscellany of popular interest articles. Advertisements are also information.

In furnishing information to the community, the element of time is a primary consideration. News is perishable: it must be obtained and passed on to the consumer, the reader, as rapidly as possible. A premium is placed on speed of production. The newspaper which prints the news of an event ahead of its competitors is judged successful: it enjoys the monopoly of the "scoop."

This emphasis on rapidity of output has made newspapers extremely efficient and complex organizations. The plants in general are better planned and more elaborately equipped that ordinary printshops. In the attempt to reduce the time element to a minimum, the radio has become an important addition to many plants. The radio however has a serious drawback—it retains no record of the news. A speech may be broadcast but unless the following editions carry a transcript of it in printed page form it will be lost to those who were unable to dial in on the audition.

The educational relationship of the newspaper to the community likewise shows in the planning of the building. Educational facilities are sometimes provided: weather bureau, geographical studies, auditorium, display rooms for art exhibits, flower shows, model home furnishings, domestic science laboratories, and the like. Business offices, usually those of advertising companies, are often conveniently located in the same building with the newspaper for the advantages offered. The newspaper is more than *vox populi:* in its role of education it assumes civic leadership. Many cities and towns have grown from the editorial campaigns for political reform, good roads and better housing. As an impartial critic the newspaper is—or should be—a moving force for community planning.

2. Book and magazine publishing plants

These also furnish the desired commodity of information to the community in the form of printed matter. The product is uniform. Magazines or books are mechanically alike in successive editions so that equipment and routine in general are easily standardized. Less emphasis is on the time element. Magazines appear at stated intervals but sufficiently separated so that there is no urgent haste for rapid publication. Books are usually scheduled for seasonal publication; speed of production is not imperative although it may indicate efficient and economical operation of the plant.

3. Job printing plants

These show no uniformity of product. Each job is unlike the others. Diversification of equipment is necessary to accommodate the varied printing needs. The time element is imperative. Business reasons usually demand rapid production of each job, and time is profit. In newspapers, however, time is more than profit, it is part of the commodity itself.

Not infrequently these three types of publishing plants are found combined in a single establishment. The printer in a small town may be printing the local paper as well as miscellaneous items and a few house organs, or a large metropolitan daily may find it profitable and convenient to run a job printing department together with its other activities.

* Biennial Census of Manufacturers, 1927. U. S. Dept. of Commerce, Bureau of the Census.

Mayfield Aerial Survey

This site meets favorably the distribution requirements of the McCall company. It is the center of a large paper manufacturing district and offers a supply of higher class labor. Both railroad and trucking facilities are afforded. Printing operations are easily conducted on the ground floor. The plant, several times expanded, consists of two manufacturing units, magazines and patterns, separated by railroad sidings.

Railroad sidings for receiving and shipping. At left, the printing unit. At right, pattern unit. The two platforms are cross-connected at south end of building.

McCALL PUBLISHING PLANT
DAYTON, OHIO
LOCKWOOD GREENE ENGINEERS, INC.

RELATION OF COMMUNITY TO PLANT

Choice of site depends largely on the type of plant and the community it touches in the manufacture and distribution of its product.

The time element determines the value of the site for the newspaper. Traffic movements and distribution of population must be considered. What gain is there in clipping a few minutes off the production schedule if a half hour is lost by the delivery trucks in bucking adverse traffic congestion which could have been obviated by a more suitable location? Nor should a plant be placed so far from its class of readers that a disproportionate amount of time is required for the product to reach them. Several New York and Chicago papers have found it necessary to build branch plants in order to more conveniently and rapidly distribute the editions to certain localities.

A study of *community movements* is also essential. Samuel P. Weston, newspaper consultant, suggests that planning of the newspaper plant should begin with a study of the needs of the delivery and mailing rooms. Trucks should be able to swing out into—not against—the flow of traffic. Nor should trucking space be so allotted that it interferes with pedestrian traffic on the sidewalks. A site which fronts on several streets or alleys allows advantageous disposition of trucking space as well as good daylight.

Future trends should be discerned. Present traffic flow and distribution of population do not suffice alone. The growth of the newspaper parallels that of the community which it serves, and for this reason it is advisable to obtain a site which will be in the line of growth of the city.

For the job printer or book publisher the site determinants are not so rigid, chiefly because of the difference in the time element. Plants are found in business sections, others in thinly settled suburban districts. Frequently the business and editorial offices may be in one locality and the printing plant in another. Proximity to customers and to labor supply is desirable. In the case of book and magazine publishers, where the product is shipped to all parts of the country, the main determinant is accessibility to sources of material and to shipping facilities. The job printer must be near his labor and sales markets. Frequently the site is selected for its low cost or rental, or for its advertising prominence: several printing establishments along the heavily travelled postroad from New York to Boston have found the location advantageous not only for trucking but also for its publicity value.

Available facilities should be considered. Paper and ink supplies usually are shipped by rail. A railroad siding expedites the receiving of materials and the shipping of the printed product. In the Chicago *Daily News* the paper rolls can be easily shipped by either rail or barge; air rights allow the building to rise over the terminal tracks, and express trains can pick up the mail editions and carry the papers rapidly to distant subscribers; from barges on the Chicago River the paper rolls are tunneled under the railroad tracks and thence by lifts into storage space in the building.

Since many plants suffer from rapid growth and consequent overcrowding, ample space should be allowed for future expansion. Many printers like a location outside the city where the cheaper land rates allow plants to expand without difficulty and also to carry on all the printing processes on the ground floor with overhead daylight illumination. Where several floors are required, vertical trucking of plates and paper becomes necessary and the mechanical difficulties of straight line production are increased. Sunlight and healthful living conditions are more easily obtained outside the large cities than in the congested districts.

In recent years there has been a tendency to group together in a single building and in a desirable locality a number of printing concerns and allied businesses. Such are the Printing Crafts Building, the Graphic Arts Center and the Master Printers' Building, all in New York City. The Printing Crafts Building, on Eighth Avenue at Thirty-third Street, houses paper and printing equipment companies as well as printing, engraving companies and binderies. Nearby are the Pennsylvania station and general post office so that outgoing mail deliveries are easily trucked by hand to the trains.

FUNCTIONS

Publishing plants comprise the following operations, in varying combinations:

1. The gathering and preparation of news or editorial matter, including advertisements and illustrations.

2. The mechanical processes of turning the photographs, drawings and art work into readiness for the desired printing.

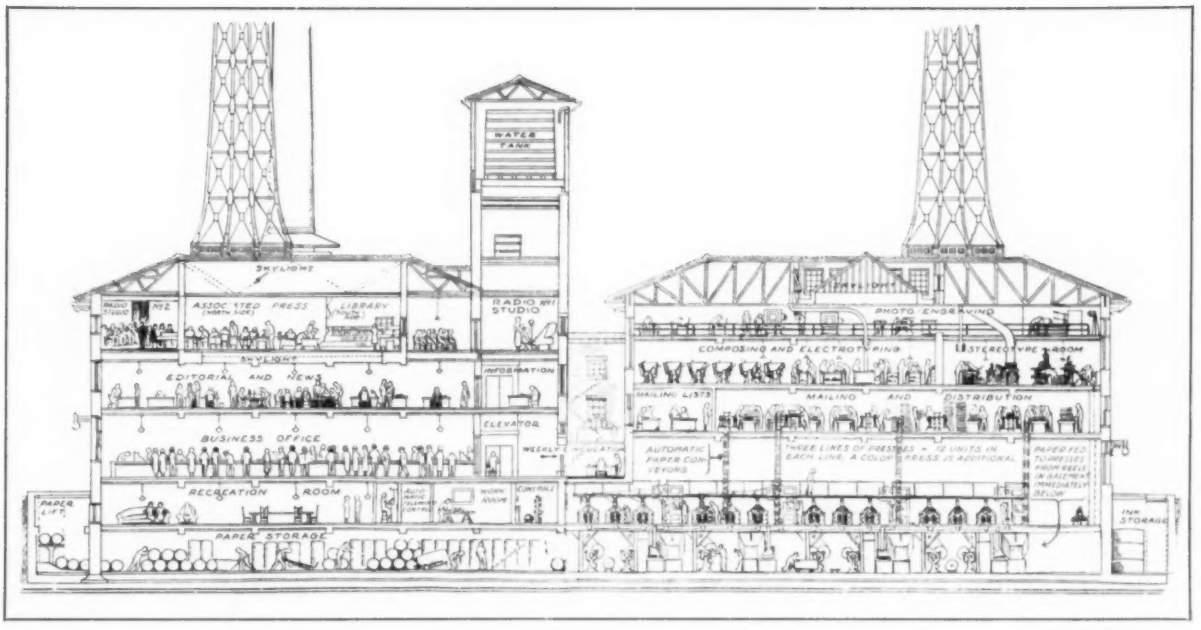
3. The composition in type of the word-matter, blocking into pages, imposing and locking up for printing.

4. The mechanical processes of printing.

5. The folding, binding, and distribution of the printed product according to circulation requirements.

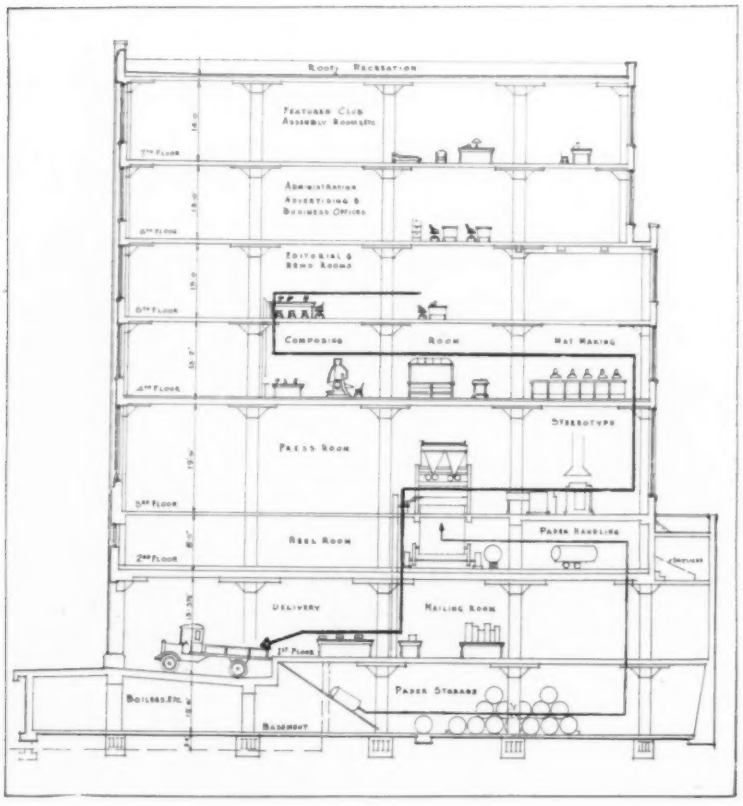
A publishing plant may comprise any or all of these functions. A newspaper performs all these operations under one roof, or in the case of a branch plant, the printing processes may be carried on elsewhere separately. A magazine may be edited in one building, the illustrations engraved in another, the text set up and printed in a third, and the editions bound and distributed through a fourth agency.

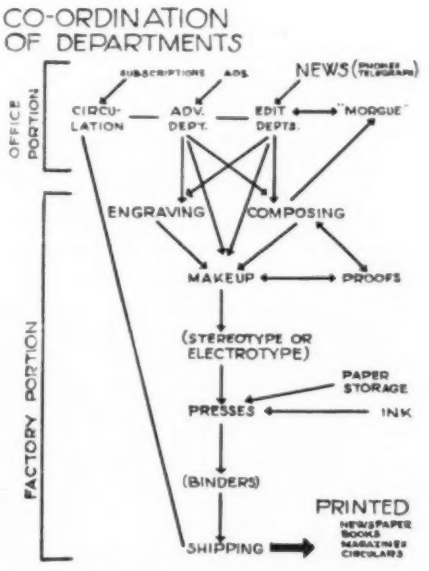
PLANT INTEGRATION



THE KANSAS CITY STAR

Separation of office and factory units.





NEW YORK TRIBUNE

Gravity principle of straight-line production.

PLANNING

Fundamentally, publishing is a combination of a business and a profession. The professional side partakes of the same needs for design and construction as are found in the professional offices of architects, bankers, advertising agents and similar groups. The printing side calls for factory requirements. The present tendency is to separate the two units where possible, although the McGraw-Hill Company, in planning a new building, has decided to key together the plant and publishing offices as a unit. Whether separated or not, it seems essential to integrate the professional and mechanical elements in terms of intercommunication systems and executive control.

1. Straight-line production is essential, both for economy of time and for efficiency of operation. This is especially true for newspaper planning. "Flow sheet" data should be compiled and studied so that back-tracking of operations will be reduced to a minimum. Many job printers who have built recently have found it desirable to place all operations on one floor. This eliminates carting materials and copy vertically from floor to floor.

Obviously, where realty values are high the building must go up several stories and it becomes necessary to superimpose the various printing operations. Belt and vertical conveyors, automatic lifts and elevators facilitate the transition between production processes. In recent years, the *gravity theory* of straight-line production, first developed by S. P. Weston in the New York *Tribune*, has come into increasing favor. With this arrangement, initial operations are placed on the upper floors and the production continues downward until the printed sheets emerge in the mailing rooms on the lowest level where they are forthwith shipped away by truck or train.

Frequently examples are found where a sharp distinction is drawn between the office portions and the factory portion of plants. This is done usually because the mechanical equipment requires a different type of construction than that of the general offices.

2. Department co-ordination is necessary for straight-line production. Each department of a newspaper has a direct relation to all other departments: each contributes toward the finished product but does not by itself complete the product. It is of utmost importance that the product be delivered from one department to the next in each step of the process with maximum dispatch and efficiency for the plant to function economically and expeditiously as a whole.

3. Future expansion should be foreseen. In many older plants efficient operation as well as satisfactory working conditions have been impaired by overcrowding of equipment owing to the rapid growth of the business. In view of constantly changing mechanical equipment, a flexible plan is demanded, one which allows expansion of certain departments without detracting from the efficiency of other departments. Radical changes in equipment should be anticipated so that there will be no necessity to change the construction of the building.

Freedom from partitions, where possible, not only economizes space, facilitates handling between departments and permits an unbroken survey of operations, but it also makes easier any changes due to replacement of machinery or to expansion. However, in many instances, partitions are necessary to shut off heat, dust, vapor or noise.

Where the plant is entirely on one floor and the ground site is large, it is comparatively easy to make new additions or alterations. Proper spacing of columns is necessary for the installation of equipment. A minimum of columns makes easier any changes in planning due to new equipment. For a ground floor plant, light-weight roof construction is desirable since the number of columns required is reduced.

4. Physical comfort and good health of employees are necessary conditions for any satisfactory plant operation. In a health survey of the printing trades, 1922-25,* undertaken by Frederick L. Hoffman, LL.D., it was discovered that while accidents are a potential danger, they are relatively rare. The three prevailing forms of sickness were found to be:

a. *Lead poisoning*. This is of minor importance now. The report shows that this ailment varies with the various processes, ranging from 0.3 per 1000 for pressmen to 3.5 per 1000 for stereotypers at the time the study was made. This is a notable decrease from conditions of the preceding decades when low wages, long hours, dust, fumes from the lead pots, and poor ventilation and light were customary.

b. *Tuberculosis*. This is also on the decline owing to recognition of the need for better working conditions. Until forced ventilation was provided, workmen were obliged to breathe dust-laden air and the fumes from nitric and other acids which they were handling.

c. *Eye infections*. These remain the most pressing need. Fine printing and certain mechanical operations, such as routing and finishing of engravings, place a severe strain on the eyes. Until the mechanism becomes developed so that human labor is not needed for these operations, efforts should be made to alleviate eye strain and infections as much as possible. Certain precautions can be observed. Men should *not* be forced to wash up in sinks used for handling vitriol or other acids. Nor should smoke and fumes from the stereotype room be allowed to escape into the composing room or the pressroom.

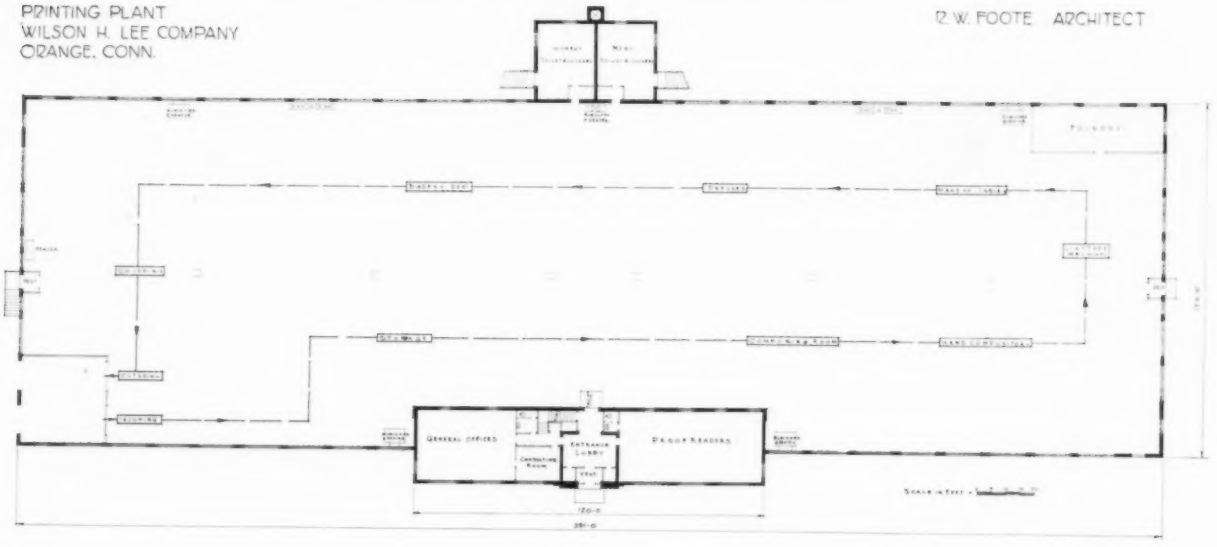
*U. S. Department of Labor, Bulletin No. 427

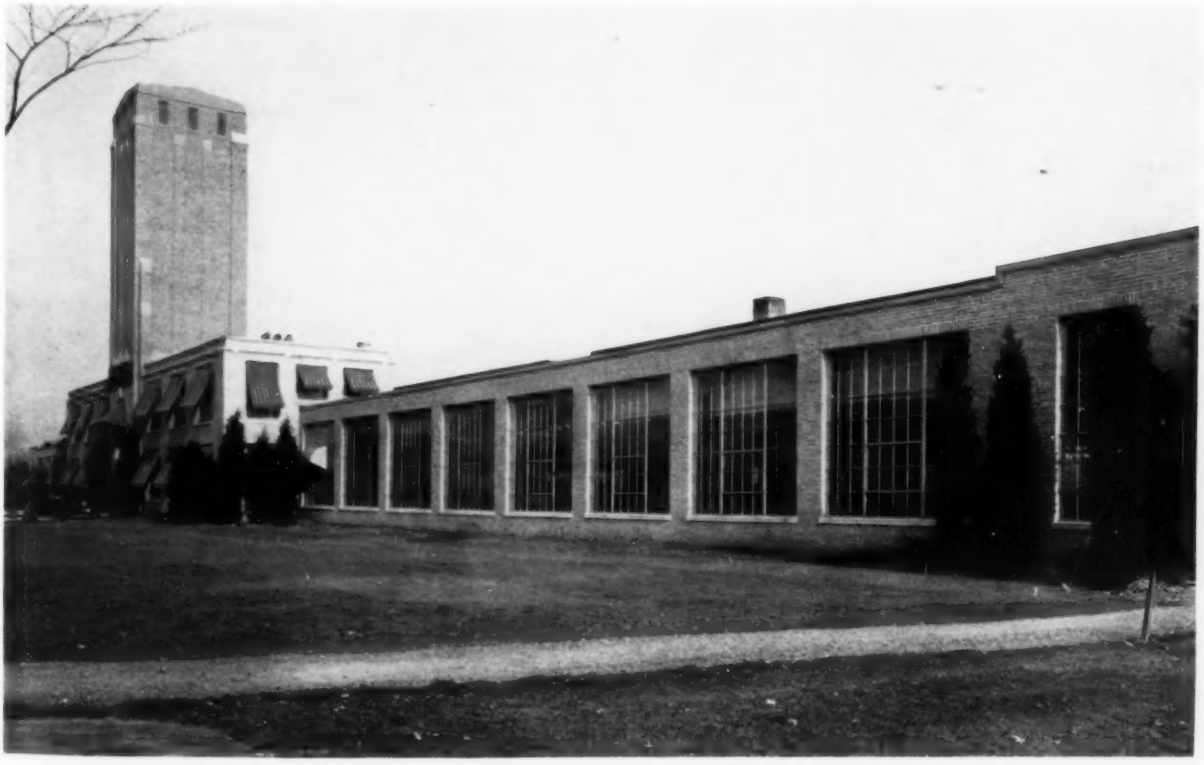
PRESSES
Ample daylight illumination is provided for all the mechanical operations.

COMPOSITION BANKS
At far corner of room is the foundry, isolated by partitions to shut off gases and fumes.

PRINTING PLANT
WILSON H. LEE COMPANY
ORANGE, CONN.

R. W. FOOTE ARCHITECT

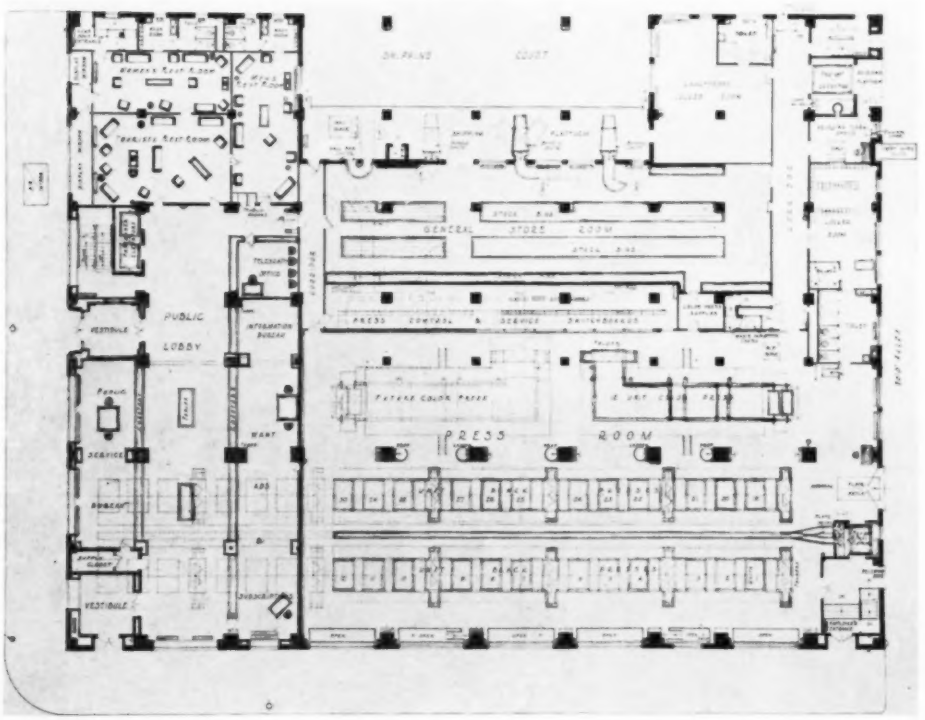




WILSON H. LEE PRINTING PLANT
ORANGE, CONNECTICUT
R. W. FOOTE, ARCHITECT

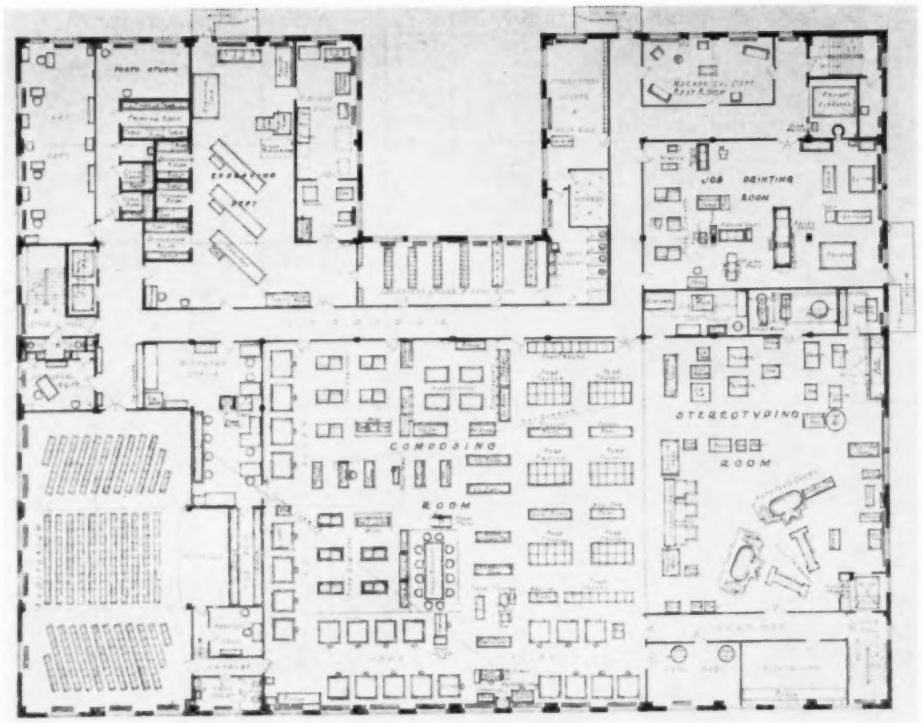
With all operations on the ground floor, straight-line production is achieved. Plant can be easily expanded.

Presses can be seen from street level, an advertising feature.

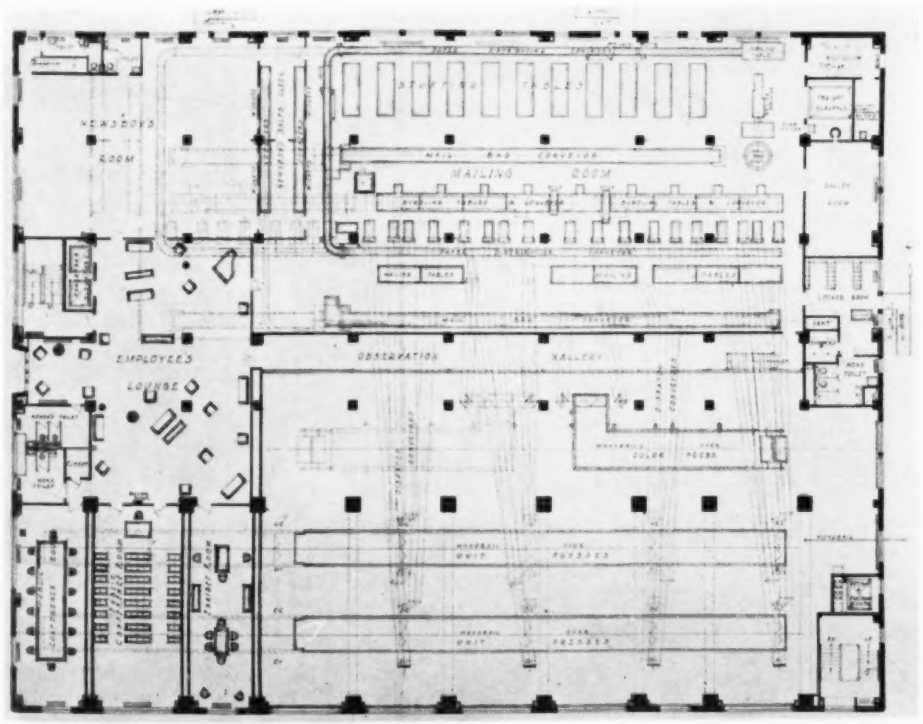


Ground floor plan illustrates division between office and factory units.

MILWAUKEE JOURNAL
FRANK D. CHASE, INC., ENGINEERS AND ARCHITECTS

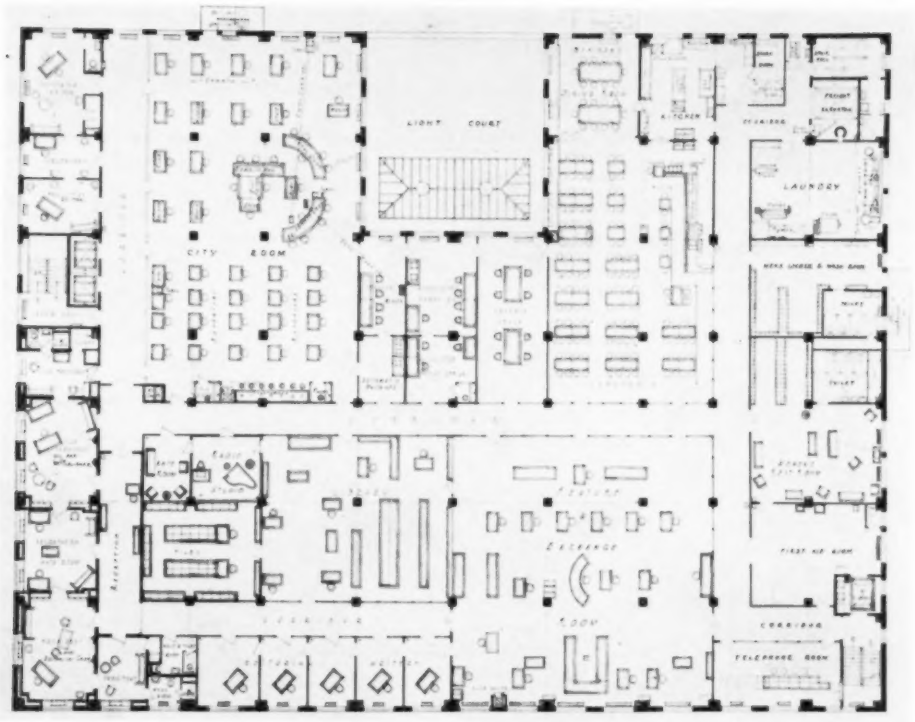


Composing, engraving and stereotyping rooms occupy fifth floor. Auditorium utilizes space allotted for future expansion.

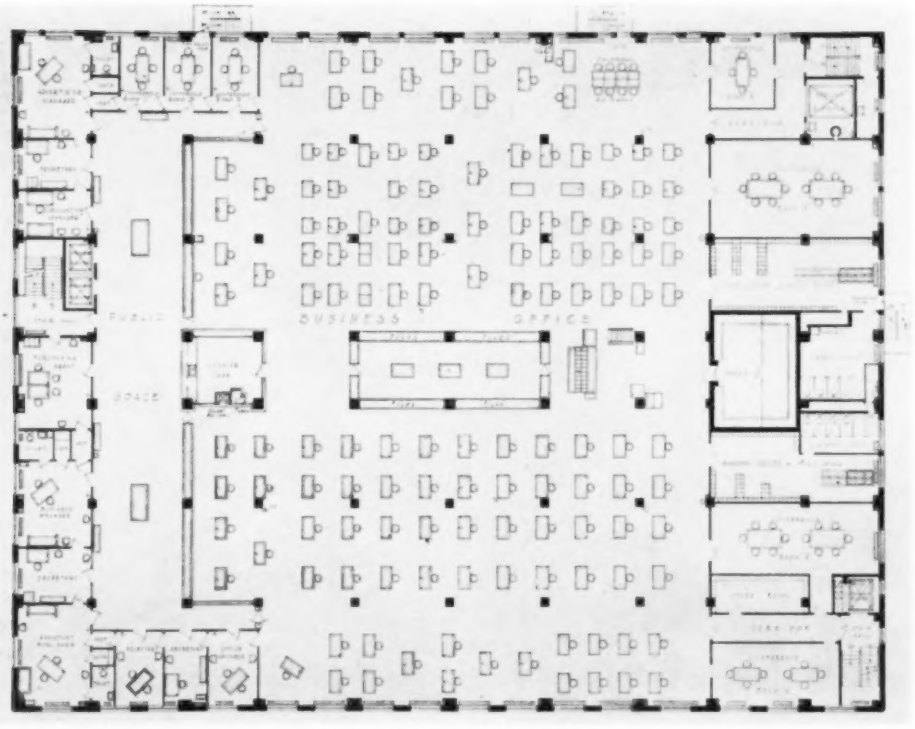


Conveyors carry papers from presses to mailing room on second floor. Chutes deliver bundles to loading platforms below.

MILWAUKEE JOURNAL
FRANK D. CHASE, INC., ENGINEERS AND ARCHITECTS



Editorial rooms are on fourth floor. Separate offices for editors and editorial writers. City room as one large unit.



Business offices are on third floor, accessible to public.

MILWAUKEE JOURNAL
FRANK D. CHASE, INC., ENGINEERS AND ARCHITECTS

CHECK LIST OF REQUIREMENTS

EDITORIAL ROOMS

Function: News comes in over telegraph wires or is written up by reporters to be edited and conveyed by vacuum tubes or other suitable means (which will not jamb or cause delays) to the copy desk in the composing room where it is set up in type. In a metropolitan newspaper the news is handled by many departments. The city desk is the nucleus. About it are the desks and telephones for the reporters and rewrite men. The telegraph editor and his assistants handle the news coming in from other localities. Other departments include the editorial and special feature writers, the sports, market, book, movies, theatre, Sunday, art, and photographic editors and their assistants.

Planning: The editorial department with its co-related financial, telegraph and photographing departments should be in close proximity to the composing room. Even though closely related physically, there should be mechanical arrangements for sending copy to the composing room copy desk.

Opinion differs whether the editorial offices should be kept in one large city room or broken up into smaller, separate units. The former is favored. In the New York *Times* city room the only private office is that of the managing editor. The Kansas City *Star* has every staff member, including the editors, in full view. It is important, according to George B. Longan, editor of the *Star*, that all those active in making the paper should be in close contact with all the others. A private office is available, he adds, but it is not used since it would shut him off from close knowledge of everything that is going on. R. L. Duffus, another journalist, also states that the newspaper office should be as open as possible, without any suggestion of the cloister: "The reporters and the editors ought to be able to sense the outer world, even though an effort is made to keep as many of its noises as possible away from them."

Lighting: Uniform intensity for office work, reading and writing. Daylight desirable, without glare of direct sunlight. In this respect the needs of a morning newspaper, whose busiest hours are after dark, differ from those of an afternoon paper.

Heating: Comfortably moderate for physically inactive occupants.

Ventilation: Fresh air supply, particularly to telephone booths.

Soundproofing: With an open city room it is obviously necessary to reduce noise of typewriters, telephones and conversation, and to minimize distracting influences.

Telephone service: Provide network of conduit systems. Soundproof 'phone booths, 3′–6″ wide, 4′–0″ deep; 18″ shelf 27″ high for typewriter, swinging bracket seat. Additional service lines such as telegraph call boxes, local fire alarm.

Flooring: Soft, sound-absorbing, easy to clean. Linoleum over concrete preferred; wood, second choice.

TELEGRAPH SERVICE

Function: News from outside localities comes in through leased telegraph wires and services such as The Associated Press and the United Press.

Planning: Adjacent to news room and financial editor.

Lighting: Similar to editorial room requirements.

Heating, ventilation: For personal comfort.

Soundproofing: Isolate and reduce noise of telegraph instruments and automatic typewriters which are very noisy.

Wire service: Cable or trunk line service to a central outlet on instrument table. Telephones required for each telegraph service.

Conveyors: Pneumatic tubes or other suitable types needed to dispatch copy to news editors. Precautions necessary to prevent jambing and delay of copy.

Flooring: Similar to editorial room.

BUSINESS OFFICES
(ADVERTISING, CIRCULATION)

Planning: The business office contains the advertising, auditing and circulation departments. The advertising department should function closely with the ad alley in the composing room, physically and mechanically. The circulation department should function very closely with the mailing room.

Public space should be readily accessible to persons seeking to subscribe or to file advertisements. It is well to separate this space from the rest of the business offices, not only to lessen distracting influences but also to control better the inside room temperature. Planning should be for inter-departmental rather than public convenience as the major consideration, since most communication between the editorial and advertising departments and the public is done by telephone, ad solicitors or reporters.

In connection with the advertising department and the composing room ad alley, there should be a publication dispatch room in large newspapers. This dispatch room receives all ad copy and arranges entirely the advertising content of the paper.

Lighting: Illumination for clerical office work.

Heating, ventilation: For personal comfort.

Soundproofing: Necessary for telephone want-ad room, where a single error is apt to prove costly.

Flooring: Similar to editorial rooms.

Telephone service: Provide network of floor conduits.

PHOTOGRAPHY

STUDIO

Function: News can be seen as well as heard. Increasing emphasis is placed on illustrations to convey information and the news photographer has become an important personage.

Planning: Public access, especially from editorial rooms. In the new building for the New York *Daily News* the photographers occupy the editorial room in close connection with the city desk. Each photographer has his own developing room with cabinets for plates, cameras, flashlight guns and other equipment. There are 25 of these rooms arranged along the sides of a square and having access to 9 printing rooms. Doors have been left off these "dark rooms." By a clever arrangement of wall angles, exterior light is shut off completely; a flip of the switch makes the white-tiled rooms dark.

Lighting: Soft, diffused to avoid glare on subject or camera, and controlled near camera. North daylight if possible but provide electric outlets on 110-volts for 30-ampere portable lamp banks.

Heating: 75°-80° best for photographic action.

Ventilation: For comfort of occupants and cleanliness of plates and prints which are affected by dust and dirt. Windows to be fixed.

Soundproofing: Not required.

Hangings: Drapes hung on roller trolleys running in two lines of box track round sides of ceiling.

Flooring: Soft, without glare. Linoleum, rugs for photographic purposes.

Accessories: Small dressing room with lavatory and dressing table.

DARK ROOMS

Planning: Accessible from studio and also from outside to avoid necessity of going through studio. Individual dark rooms. Sliding or swinging type doors, tight against light.

Lighting: General illumination with control switch on wall. Safety light on wall fixture just above sink, mounted so as to slide laterally; flexible cord connection with control switches on fixture for different colors as needed.

Heating: 70° recommended, which corresponds to approximate temperature of developing chemicals and baths.

Ventilation: Supply clean fresh air in excess of amount exhausted to keep room under slight pressure, thus keeping out dust from other rooms.

Walls: Waterproof finish for washing.

Flooring: Waterproof and resistant to action of hypo solution. Rubber suggested as best material.

Plumbing: Sinks—lead-lined wood, first choice; cedar wood, second. Acid-proof drains. Mixed hot and cold water, also ice water, in double-jointed universal outlet so as to place stream over sink where desired. Two outlets.

Rittase, Courtesy Haddon Craftsmen

GALLERY FOR PHOTOGRAPHING ILLUSTRATIONS

PHOTO PRINTING ROOMS

Planning: Adjacent to dark rooms, light shield or maze entrance. If arc type printing lamps are used, shield them from print room and vent to carry off carbon dust.

Lighting: General illumination with control switch on wall. Safety lights on wall fixture above sink, stationary mounted; control switch on fixture. Outlets for printing lamps.

Heating, ventilation, walls, flooring, plumbing: Same as for dark rooms.

ART DEPARTMENT

Planning: Photographs and line drawings frequently require retouching before copies can be reproduced. Engraving concerns usually maintain a service offering the preparation of layouts, dummies, designing, photo-retouching, label and box drawing. This art work should be within easy reach of the business office.

Lighting: Art work particularly if in color, requires north light of a constant quality.

Heating, ventilation: For personal comfort.

Soundproofing: Not necessary.

Flooring: Soft, quiet, easy to clean. Linoleum or cork.

PHOTOENGRAVING PROCESSES

GALLERY

Function: Copy from the art room is attached to a frame forming part of the camera stand and photographed on a glass plate treated with a sensitized colloidal film.

Planning: Cameras should be placed with backs to dark rooms for ease in handling plates. Access around all parts of camera but general traffic should not be near cameras. Also important that there should be no motion or vibration of cameras. This is likely to happen if manufacturing (presses in operation) is going on in same building.

Lighting: Soft, diffused. Direct glare from windows is to be avoided, for the camera lens and glass frame will catch reflections. It has been frequently found necessary to paint the window panes opaque; for this reason the gallery might well be windowless. Outlets for portable camera lamps located to permit freedom of movement of equipment; control from operator's dark room. Glare from these lamps to be shielded from rest of room.

Heating: Photographic activity varies with temperature. Fluctuations must be gauged by the machine operators according to their experience. A constant indoor temperature control would eliminate this variable element.

Ventilation: During photographic action, usually from 2 to 3 minutes, strong carbon arc lamps are focussed on the object frame. The carbon arcs give off a white powdery cloud which will settle as a dust unless removed by ventilators.

Air conditioning: Excessive moisture content of the air may cause condensation on the glass plates and screens. Under ordinary conditions this is unlikely.

Walls: Soft color, without glare. Smooth finish to prevent collection of carbon dust and to permit wiping.

Flooring: Easy to stand on for long periods. No trucking or chemical action.

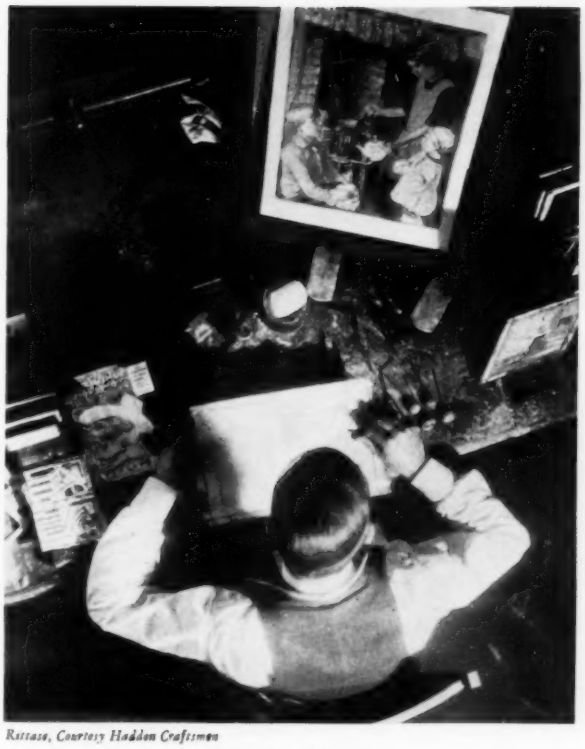
Vibration: Equipment does not produce noise or vibration but should be protected against violent shocks.

DARK ROOMS

Function: Each projection operator has his own dark room where the exposed plate is developed, fixed and intensified.

Planning: Preferably arranged in a row back of cameras. Consider convenience of delivering plates and copy to stripping department.

Lighting: General ceiling illumination, control switch on wall. Safety light, indirect, on wall fixture just above back of sink and mounted to slide laterally so that operator can look through negative with greatest ease. Control switches on fixture for different colors as needed.



Rattase, Courtesy Haddon Craftsmen

FINISHING A HALFTONE NEGATIVE

Heating: Constant at 70°, approximate temperature of chemicals and bath.

Ventilation: Necessary to carry off obnoxious fumes. Direct air supply downward from upper right hand rear corner of room into sink, with exhaust intake just above and back of the sink where odors arise from plates in sink.

Air conditioning: Air should be filtered and free from dust since particles will spoil the plates. Humidity changes affect strength of solutions and acids.

Walls: Waterproof finish for washing.

Flooring: Waterproof finish to resist acid and hypo action. Rubber recommended.

Plumbing: Acid-proof drains. Water mixed hot and cold in double-jointed outlet about 5′ above floor. Ice water connection preferred if summer temperature of cold water is above 65°. Sinks to resist hypo solutions—glass, lead and rubber not affected; lead-lined cedar best, with alberene stone and asphalted cedar as alternates.

STRIPPING AND PRINTING

Function: The finished negative is next manipulated to print on metal. It is coated with rubber solution and collodion, cut to size and soaked in acetic acid to be loosened from the glass plate. After being stripped, it is turned over and grouped with other negatives on a larger plate glass, ready for the printing frame. Zinc is used for line work, copper for

halftones. Both metals are coated with sensitizers. Light action from powerful carbon arc lamps makes the sensitized surface insoluble in water; portions protected by negative will dissolve.
Planning: Locate for easy flow of work between dark rooms and etching rooms.
Lighting: General illumination. Local light under stripping frame or bench. Printing lamps, portable carbon arcs. Daylight desirable over stripping sink and bench. Printing in semi-dark area, away from direct sunlight.
Ventilation: Necessary to carry off film coating fumes at stripping sink and carbon dust from arc lamps.
Air conditioning: Filtered air, free from dust. Humidity must not become excessive: otherwise the negatives absorb moisture from the air and become soggy which necessitates their being rebaked in the oven.
Flooring: Easy to stand on and to clean.
Plumbing: Acid-proof drains. Equipment requirements similar to those for dark rooms.

ETCHING

Function: Zinc plates are rolled with etching ink, developed in water, dusted with powder which is heated to melt, making the inked image impervious to acid action but leaving desired surfaces exposed.

Etching is carried on in successive "bitings" until the necessary depth is reached. A resinous powder called "dragon's blood" is dusted over the line plate, brushed in and melted by heat to prevent undercutting or lateral etching.

Copper etching is usually separated from the zinc etching since a different acid, iron perchloride, is used. Progress of the first bite is shown in relief by powdered calc. Tones to be held are painted over with an acid resistant, the plate is heated and cooled, and etching continued by stages. Requirements are much the same as those for zinc etching.
Planning: Locate near printing and also finishing and Benday screen rooms.
Lighting: General illumination. Strong daylight desirable for observing face of zinc plate while etching.
Heating: Temperature changes affect the printing and etching activity. In summer, the room temperature frequently becomes excessively high because of the heat that is produced from the stoves. Constant temperature and air changes at all times are requisite for both the chemical processes and personal comfort.
Ventilation: Exhaust only to remove odors and acid fumes. Baths are guarded by covers and fans discharge fumes through acid-proof ducts direct to outside of building or into exhaust system if properly diluted. Dust particles of dragon's blood will also be absorbed in breathing unless controlled by exhaust ventilation. No fresh air supply—allow air to enter from other rooms to prevent fumes entering other departments.
Air conditioning: Not necessary for process.
Walls: Smooth finish to avoid collection of dust.
Floors: Acid-proof, pitch to drains. Quarry tile recommended.
Plumbing: Acid-proof drains from sink and floor drains under etching machine outlets. Water mixed hot and cold in double-jointed outlet 5′ above floor. Sink of alberene stone or asphalted cedar to resist nitric acid action.

BENDAY SCREENS

Function: For tint-laying additional plates must be made, one for each color.
Planning: Near printing and etching room.
Lighting: Uniformly controlled north light so that color can be properly matched. "Daylight" electric lamps for night work.

ROUTING AND BLOCKING

Function: Routing is the mechanical operation of cutting away the surplus metal of the printing plate. Unless for newspaper reproduction, the plates are nailed to wood blocks or, in special cases, sweated to a solid metal type-high base. The mounted plates are sawed to size, trimmed for exact square and planed to exact type height.
Planning: Near finishing room.
Lighting: The work calls for the greatest precision. Ordinary daylight illumination is insufficient; concentrated artificial lighting is provided on each machine, so it is not necessary to place the machines near windows.
Air conditioning: Since wood will swell with moisture changes and exact dimensions are required, humidity control is advisable.
Soundproofing: Isolation desirable since cutting tools and saws produce noise.
Flooring: Easy to stand on and able to withstand abrasive action of metal chips. No trucking.

FINISHING AND PROOFING

Function and planning: All halftone etchings require work by the finishing department before reaching the routing stage. But all zinc and copper engravings are tooled for small irregularities by the finisher after being mounted. These operations consequently should be near together, though it is desirable to isolate the noise of routing and blocking.
Lighting: General illumination for finishing which requires good reflection from face of zinc plates. Uniform north light for proofing presses if matching colors.
Heating, ventilation: For personal comfort.
Air conditioning: Not required, except possibly for close register on color proofing presses.
Flooring: Easy to stand on. No trucking.

COMPOSING DEPARTMENT

Function: In a newspaper composing room operations move speedily. Copy is taken from the pneumatic tubes and distributed to the linotype operators. At deadline time, when the paper must go to press, each operator sets not more than 3½ inches of type on a story. When his take is finished he puts the slugs on a dump where an assembler pieces together the complete article and turns the galley over to a proofer. Proofs are read and corrections, if needed, are made. The make-up man makes up the complete page from the corrected galleys. Lockup for late copy can be finished within ten minutes after the copy is received by the compositors.

For other kinds of printing plants the routine is much the same. Type is usually set up by hand, or by hand-operated machines—linotype or intertype, which cast slugs (solid lines of type) or monotype, which sets justified lines of single type. Ludlow is used mostly for display lines; type is cast from matrices which are composed by hand and distributed after casting. The linotype machines have lead pots for casting the slugs; ventilation consequently is necessary to remove the fumes and individual ducts sometimes are used above machines. The monotype machines are in two parts—keyboards and casters.

The larger display sizes of type are still set up by hand and the assembling and make-up work is largely by hand.

Planning: Communication with engraving and editorial departments, also pressroom, especially in book and job plants. Casting machines, which give off fumes and noise, should be placed in a separate room controlled for both ventilation and sound insulation. Monotype casters practically have to be isolated; they are very noisy. The keyboard operators should be so arranged that attention will not be diverted from copy. Room should be higher than ordinary office floors, usually about 13′ floor to ceiling. Calculate floor load of 200 lbs. per sq. ft. for rigidity against vibration and heavy concentrated loads, present or future.

Lighting: Frequently the typesetting machines are so placed that the operators face strong light coming in through the windows or else their own shadows fall across the keyboards. These conditions are to be avoided. Local lights used on typesetting machines and makeup banks; outlets should be in the floor. For imposition illumination should be of high intensity, without glare, so that reflection from type face is definite but not objectionable; mercury vapor lamps are recommended to reduce eye strain. The entire ad alley and make-up area should have a blanket of uniform candle power at the working plane so that hand composition or reading of type can be done at any point.

Heating: Constant temperature, moderate for comfort. Machines create considerable heat.

Ventilation: For personal comfort. Not necessary for mechanical operation except for smelting pots on monotype casters which can be isolated or on linotypes which can be separately ventilated. Individual ducts often used on monotype casters.

Air conditioning: Not necessary for mechanical operation.

Soundproofing: Desirable to deaden or isolate sounds of noisy typesetting equipment.

Flooring: Easy to stand on and able to withstand light trucking. Provide for outlets.

Services: Conduits for power, gas, water, drain and air to various machines should be laid above structural floor slab but below finished floor for present or future access or extension.

COMPOSING ROOM, McCALL PLANT
LOCKWOOD GREENE ENGINEERS, INC.

PROOFREADING

Function: Proofreading is usually performed by pairs—one reads from the original copy, the other checks the proof.

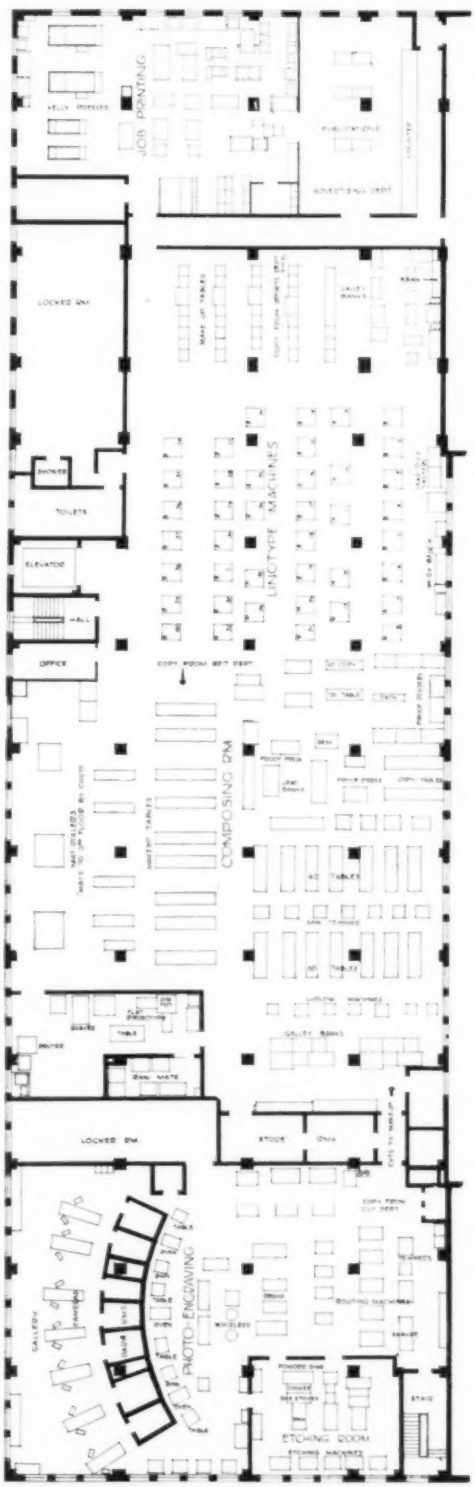
Planning: Usually in or near the composing room. It should be isolated from the sounds and activity of the composing room. Mark-offs from galley proofs should be placed on a hook in the center of the room so that readers will not be required to wander about from desk to desk in search of some particular copy, thus diverting attention. Other employees should be forbidden entrance.

Lighting: General illumination, local desk lights, for reading and checking.

Soundproofing: Very necessary to deaden and isolate all noises. All readers' desks should be enclosed in front and on the sides so that a reader with a harsh or squeaky voice will not be a source of annoyance to other readers.

Press and stereotype rooms, third floor

NEW YORK DAILY NEWS
LOCKWOOD GREENE ENGINEERS, INC.
HOOD AND HOWELLS, ARCHITECTS



Composing and photoengraving rooms, sixth floor.

FOUNDRY OPERATIONS

Function: For small editions the original plates and type are used in the printing process. But where the editions are large or speed in production is required it becomes necessary to duplicate the forms many times. This duplication is performed usually either by stereotyping (confined to newspapers) or by electrotyping the plates and type.

Stereotyping: When the newspaper forms are completed and locked up, they are conveyed by transfer trucks to molding machines where matrices or "mats" are made. Steam-heated presses record the impressions of the type matter on the matrix, a fabric of special composition. These mats are curved, backed where necessary with reinforcing pads, and placed in the autoplate casters, which are flooded with molten metal from a large metal pot. The casters can turn out four semi-cylindrical plates a minute, cast, shaved, water-cooled, brushed, and en route to the printing presses by conveyors.

Electrotyping: This process is used for large magazine or book editions and also better grade commercial printing. It consists in making a mold in wax or prepared lead on which a coating of copper is electrolytically deposited. The copper film is then backed with molten metal alloy.

Planning: Since *plates* are supplied to the presses, the stereotyping department must of necessity be as near (either horizontally or vertically) the pressroom as possible. Since the plates are made from *forms* fabricated in the composing room, the stereotyping room should also be adjacent to the composing room. Since it is easier to convey the mats than the heavy plates, the stereotype foundry can be located to better advantage on the same floor with the presses than on the composing room floor, if it is found necessary to separate the operations.

The stereotyping department handles plate or job casts as well as curved plate work. In the largest plants the work is separated and handled by independent crews. In smaller plants the division is dependent on cost and labor conditions. A saving in labor is often possible with a combined department wherein the men work on either job or plate work as needed.

When a metropolitan paper maintains a branch plant in another part of the city, mats are made in the central plant, chuted to the street and rushed crosstown to the branch foundry. This procedure is usually followed by New York papers printing a Brooklyn edition.

In newspaper plants conveyors carry the plates from the stereotype room to the pressroom and back again after being used to be resmelted.

Calculate floor loads of 500 lbs. per sq. ft. for space around large metal pots, 200 lbs. per sq. ft. for general department, to assure rigidity against mechanical vibrations and concentrated loads, present or future.

STEREOTYPE ROOM, N. Y. DAILY NEWS
LOCKWOOD GREENE ENGINEERS, INC.
HOOD AND HOWELLS, ARCHITECTS

Lighting: Fairly high intensity, without glare. Mercury vapor suggested to relieve eyestrain.

Heating: Moderate for personal comfort. Control heat given off by pots and dryers.

Ventilation: For comfort. Hoods over metal pots to prevent fumes from penetrating the room.

When the composing and stereotyping rooms are on the same floor, it is often good engineering to supply all the air to the composing room and exhaust it from a point over the metal pot. This method eliminates heat and odors from the composing room.

Because the various plant departments operate at different hours, the ventilation system should be so designed that in order to obtain ventilation in one department it will not be necessary to operate the equipment for the entire building.

Air conditioning: Not necessary. Mats are conditioned in special apparatus to the desired moisture content and are handled so rapidly that humidity variations have a negligible effect.

Soundproofing: Not required.

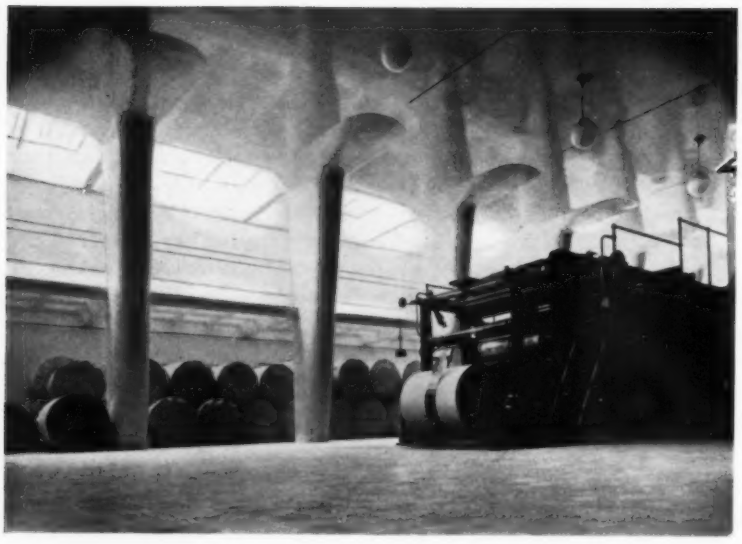
Flooring: To withstand heavy trucking and battering from dropping of plates. Standard wood block over soft but rigid fill in which conduits and pipes are placed.

Services: Power, gas, water, drain and air to various machines to be laid in fill between structural floor slab and finished flooring for ready access. Monorails over heavy equipment. Water supply may be recirculated from large tank.

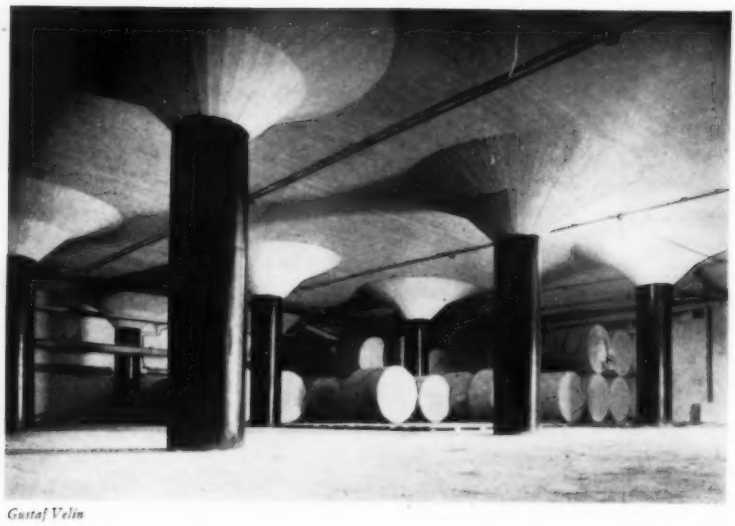
Drainage: From cooling system of casting and finishing machines; open discharge into large pipe, with common trap to intercept metal chips and oil.

TURUN SANOMAT
NEWSPAPER PLANT
HELSINGFORS, FINLAND
ALVAR AALTO, ARCHITECT

Composing room



Press room



Paper storage

Gustaf Velin

PRESSES

Function: When the locked-up forms, stereotype cylinder plates or electrotypes come to the pressroom, they are placed in the presses. This process varies greatly from a few minutes for the newspaper rotaries to many hours for flat-bed presses when "makeready" (building up impressions with underlays or overlays and "spotting") for exact register and inking surface is demanded.

Varieties of printing machines are too numerous to detail. Whatever the type of press in use, the general requirements are much the same.

Planning: A high spacious room aids to maintain uniform operating conditions and is necessary to accommodate large presses. Ready access between press floor and paper service floor. If pressroom is not to be seen from the street level—sometimes desirable for advertising purposes—it is advisable then to have a visitors' gallery on a mezzanine floor from which they can watch the presses whirring out the editions. Such an arrangement prevents the occurrence of accidents.

The newspaper press is a long, narrow, highly efficient and speedy combination of separate printing units. The unusual length of the press necessitates a long, narrow pressroom, an unwieldy element in the plant. It is important that the mailing room be directly adjacent and parallel, if possible, to the pressroom and that the trucking space connect directly with the mailing room.

Lighting: General illumination. Local lights for press operation. Lights on cords for use on bed of press, etc. Controlled north light for color presses.

Heating: Uniform at 80° for best ink action.

Ventilation: Desirable to carry off ink and paper dust, and heat of press motors. Temperature and humidity to be controlled.

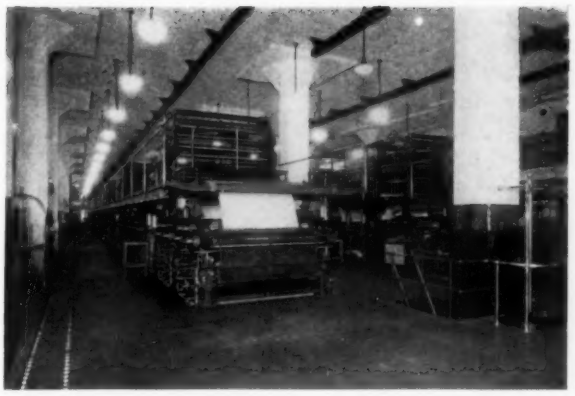
Air conditioning: Difficulties occur when the relative humidity is too low, too high, or variable.

Absolute control of register, particularly in color work, is essential. The process plates—yellow, red, blue and black—require special impressions and are usually run a day apart for drying. If there is no humidity control, the paper will very likely show a stretch or contraction between runs.

Press rollers, mostly glue and glycerine, take on and throw off moisture in response to changes in relative humidity. These changes affect the life of the rollers as well as their operation. Water-logged rollers separate the ink ingredients. Dried rollers become hard and crack. Curtis plant's biggest saving with humidification is on rollers.

Soundproofing: Ceilings and walls treated to reduce press noises.

Isolation: Presses should be isolated from building structure by permanent, highly resilient material below substructure of press. This prevents press noises telegraphing through building and also improves press operation.



PRESS ROOM, N. Y. DAILY NEWS
LOCKWOOD GREENE ENGINEERS, INC.
HOOD AND HOWELLS, ARCHITECTS

Monorails: 2-ton capacity, over presses for erection and repair service.

Walls: Smooth, waterproof finish for ease in cleaning off ink and paper dust.

Floors: To withstand heavy trucking and abuse from metal plates; easy to repair. Access space to press drive shafts. Floor becomes oily and slippery from ink, oil, type metal. Wood blocks are less slippery and less damaging to edges of new press plates if dropped. In some of the latest plants the floor separating the reel room from the pressroom is checkered steel plate or metal grids, isolated from the presses so that no vibration is transmitted and with removable sections providing access to motors and press drives.

Services: Washing facilities should be conveniently accessible, since printers must frequently wash their hands of ink stains and they should not have far to go to reach soap and water.

REEL ROOM

Function: In the printing of newspapers, the paper rolls are fed into the presses from the floor below, called the reel room. A system of tracks, switches and turntables allows the rolls to be moved from storage space and installed on the presses without any cessation of the printing operation.

Planning: Pressmen use stairs coming up from the reel room but prefer to go down by gravity on "firemen's poles." Automatic lifts deliver the paper rolls from storage floors to the reel room floor, which should be partly raised to facilitate placing the rolls on the small trucks which convey them on tracks to the presses.

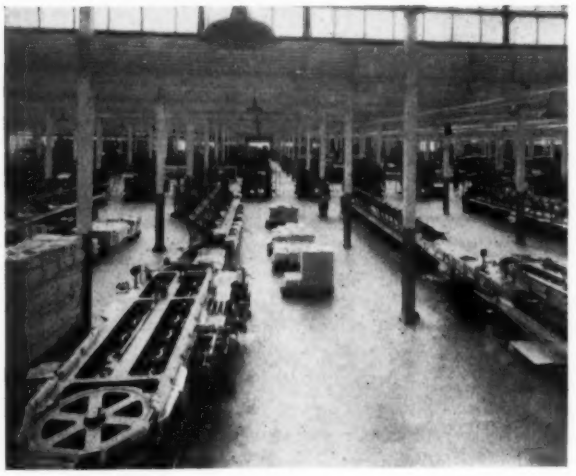
Air conditioning: It is desirable to have sufficient paper storage space in the reel room in order to allow for the absorption of some moisture from the conditioned air in the reel room.

Flooring: Concrete with track system for handling paper; otherwise no heavy trucking.

BINDERY

Function: Newspapers are automatically folded and go directly to the mailing room for delivery. Magazines and books, however, are printed in signatures of 16, 32 or 64 pages. These signatures are collated, stitched or stapled together by machinery. Covers are glued on and pages trimmed to size.
Planning: Accessible to shipping rooms.
Lighting: Uniform illumination.
Heating: Controlled, uniform.
Ventilation: To remove disagreeable odor of glue.
Air conditioning: Slight changes in moisture content are less serious in the bindery than in the pressroom but a low or unduly high humidity is the cause of much spoiled work. Static electricity, curling and bulging of sheets, shrinkage or stretching of paper cause trouble but the most serious difficulty is the cracking or breaking of sheets when folded. This is often due to use of heaters (for ink setting) on press. Thin papers fold better than thick, uncoated papers better than coated. Since a dry atmosphere makes the paper weaker and more brittle, a high relative humidity is recommended.

The consistency and drying properties of glues and pastes are also affected.
Flooring: Easy to stand on.



BINDERY, McCALL PLANT
LOCKWOOD GREENE ENGINEERS, INC.

MAILING ROOMS

Function: The folded newspapers, as they come out of the pressroom on belt conveyors, are stacked, stuffed, bundled and rushed to waiting trucks or trains for distribution. With magazines, books and other printed matter speed is not so essential, but the process should be expedited as much as possible.

Planning: Ample working and trucking space is desirable; likewise, easy access to the loading platforms. Furthermore there should be no conflict between incoming supplies and outgoing products.

Loading platforms should be outside or below the delivery rooms and so arranged that men loading the trucks will be sheltered from rain or snow. Ample trucking space is desirable to take care of future expansion and unusual peak-load rushes. This trucking space should in nowise interfere with street traffic.
Lighting: Uniform illumination.
Heating: Moderate, constant temperature.
Ventilation: For personal comfort.
Air conditioning: Not required.
Soundproofing: Not required.
Flooring: To withstand moderate trucking.

MAILING ROOM, DETROIT NEWS
ALBERT KAHN, ARCHITECT

ANCILLARY DEPARTMENTS

Welfare of employees

A hospital room, with separate toilet facilities, is desirable for emergency cases.

The New York *Daily News*, for instance, has a small clinic with a nurse in charge at all times. Regular prophylactic dental service is given free. A dentist examines teeth twice yearly and gives advice on oral hygiene. The newest equipment is furnished for medical treatment. Sinks are knee-operated to keep hands sterile.

Recreation, reading and rest rooms for employees, as well as luncheon or cafeteria facilities, have a decided influence in maintaining a good morale.

Washroom facilities

Not only should sinks be provided in the pressroom for frequent washing up but the facilities in the locker rooms should be such that many men can be accommodated without overcrowding. The wash fountain type has been found very satisfactory. Sinks used for acids should be used under no conditions for personal washing. Showers are desirable.

Plumbing equipment should be fool proof. Ordinary house fixtures are unsuited. Special plumbing is necessary for acid wastes. Closet bowls should be of heavy porcelain, easy to clean and equipped with extra large waste openings to remove pocket rules, cigarette boxes and the like which may be dropped in by accident. Printers are congenitally careless in this respect.

Incoming supplies

Incoming newspaper rolls are rolled, trucked or conveyed by gravity rollers from sheltered loading platforms to huge hoists and thence to storage floors. Special apparatus lifts the heavy rolls into tiers three high where they are stored until needed.

Ink is stored in huge tanks, filled from tank trucks on the outside street level or from railroad tank cars. It should be continuously circulated or agitated to prevent settlement and separation; 80° is the best operating temperature.

Stockroom

This should be near the purchasing department and accessible to the freight elevator or to those departments in frequent need of such supplies.

Paper storage

Function: Large supplies of paper must be kept on hand in any plant, particularly newspapers, to prevent any tie-up of material from mill fires, transportation delays, strikes, or other unforeseen events.
Planning: Accessible to presses.
Lighting: Fair intensity, controlled for various storage sections.
Heating: Uniformly moderate, same as pressroom temperature.
Ventilation: Not necessary.
Flooring: Concrete finish suitable for moderate trucking, slightly pitched to facilitate drainage of water in case of pipe leakage or other accidental flooding. Floors to withstand shock of rolls sliding down from upper tiers. Loading calculations depend on height of storage.

Water storage

In large newspaper plants so much water is used in cooling hot metal that for economy of consumption the water, after it has passed through the various pieces of apparatus, is pumped to a storage tank. The water from this tank is then used in the plumbing fixtures.

Electrical control room

The press drive and the stereotyping metal pots require heavy wire and conduits. For economy it is advisable to locate the control room so that a minimum of copper is required.

Job press

Many newspapers have job press departments to print internal office forms, circulation and advertising promotion, and sometimes outside jobs. The requirements are like those already noted.

Machine shop

For quick repairs of equipment a machine shop, completely equipped with lathes, hack saws, drill press and other machinery, is desirable. It should be centrally located so that carpenters and machinists can be easily reached. An overhead track system is excellent for carrying heavy cylinders and press parts to this shop. The shop should be accessible to incoming supplies and insulated for noise.

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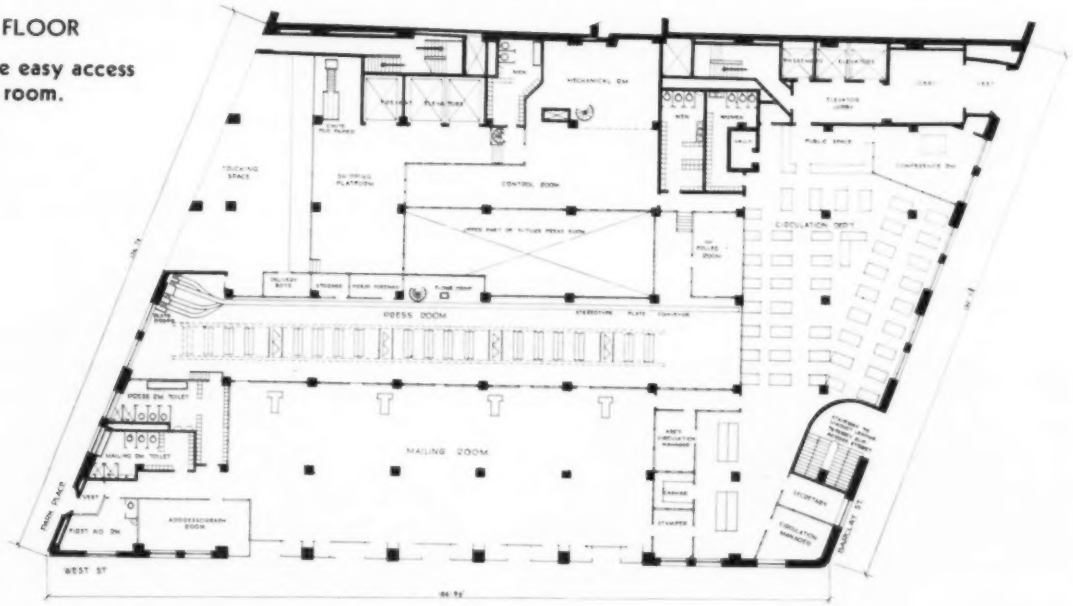
NEW BUILDING FOR
NEW YORK TELEGRAM

J. W. THOMAS,
ARCHITECT

GROUND FLOOR

Trucks have easy access to mailing room.



THIRD FLOOR

SECOND FLOOR

AIR CONDITIONING OF PRINTING PLANTS

In the processing of any hygroscopic material, control of the relative humidity is an important factor. Paper is sensitive to moisture. The printing and lithographic trades especially require a definite and unvaried humidity so that frequently, even hourly, the normal quantity of moisture in the air must be increased, other times decreased. Exact humidity control is necessary for proper register of successive printings of different colors on a sheet of paper.

WEATHER CONDITIONS

During the winter conditions in the pressrooms and printshops are particularly bad. Although the outside humidity may be fairly high, the air temperature is low and when this air is heated to building temperatures, the relative humidity suffers a serious reduction. As an example, air at 40° F. and 50 per cent relative humidity, which are normal weather conditions, when heated to 75° shows a reduction in the relative humidity to 15 per cent. This is unsatisfactory for both the workmen and the mechanical operations.

In summer conditions are frequently just the converse. Summer air contains a considerable quantity of moisture. If the temperature is rapidly reduced, then the quantity of moisture remaining constant, the relative humidity must increase, and if the air contains more water than it can hold at that temperature, there will be condensation, especially near walls or any cold object. A normal, comfortably hot day in the summer might have a temperature of 90° F. and a humidity of 60 per cent. It is only necessary to drop the temperature to 74° to cause over 100 per cent humidity as a consequent condensation of water vapor.

RELATIVE HUMIDITY AND PAPER

Paper absorbs or gives up moisture until it comes to equilibrium with the existing temperature of the room. In fact, ordinary paper is never absolutely dry, as shown by the following table:

% Relative Humidity	100	90	80	70	60	50	40	30	20
% Moisture in Paper	21.5	13.5	8.9	8.4	6.5	5.6	3.4	2.3	1.8

Temperature..70° F.

When paper is exposed freely to the air, changes in moisture content take place rapidly. If covered by other sheets the change may be very slow and unequal.

Humidity affects paper in nearly all its valuable characteristics:

1. *Dimensions.* Changes in moisture content cause the cellulose fibres of paper to swell or shrink, resulting in corresponding changes in length, width and thickness of each sheet. This property of paper is familiar to architects who have had experience in making stretches of Whatman paper. A 74″ sheet may vary as much as ½″ from one day to the next. Sudden changes in relative humidity will make paper curl, or if piled, wave or buckle at the edges.
2. *Electrical conductivity.* Static electricity in paper gives much trouble in unhumidified print shops. When paper is dry it becomes readily charged with electricity and clings to everything it touches. In a moist atmosphere static charges are less easily generated and more quickly neutralized or grounded.
3. *Strength* of paper also depends on moisture content.
4. *Folding endurance.* A report of the Bureau of Standards states that the folding endurance of paper increases regularly, as the relative humidity lies between 15 and 83 per cent.
5. *Inking properties* are better under humidity control.

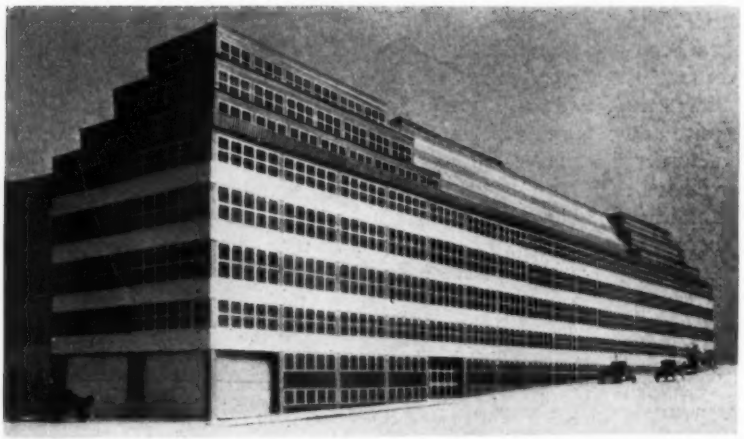
EFFECT OF ATMOSPHERIC CONDITIONS ON HEALTH AND COMFORT

Studies on effective temperature, undertaken by the A. S. H. V. E., in cooperation with the United States Public Health Service and the United States Bureau of Mines, indicate the importance of relative humidity to health. The subject is comparatively new and many tests have yet to be made to determine accurately the comfort zones which are most beneficial to health.

Too much moisture in the air, coupled with high temperature, is obviously uncomfortable. Too low a relative humidity is physiologically harmful. According to Dr. W. W. Wilson of the United States Weather Bureau, the evaporative power of the air at a relative humidity of as low as 30 per cent is very great and when the mucous membranes and tissues of the respiratory tract are subjected to this trying process, the glands must increase their functional activity in order to keep the membranes in proper physiological condition. This increase of activity tends to make the glands become enlarged and the membranes to become thickened and harsh, causing the surface to be receptive to disease germs. Cases have been observed where catarrhal troubles have been relieved by simply introducing sufficient moisture into the air to bring conditions to something nearly normal. In plants where humidification has been adopted, fewer colds and sore throats occur.

According to medical opinion and effective temperature between 65° and 70° is considered good. This may be increased to 80° or even 82° occasionally during summer weather without excessive discomfort or injury to health.

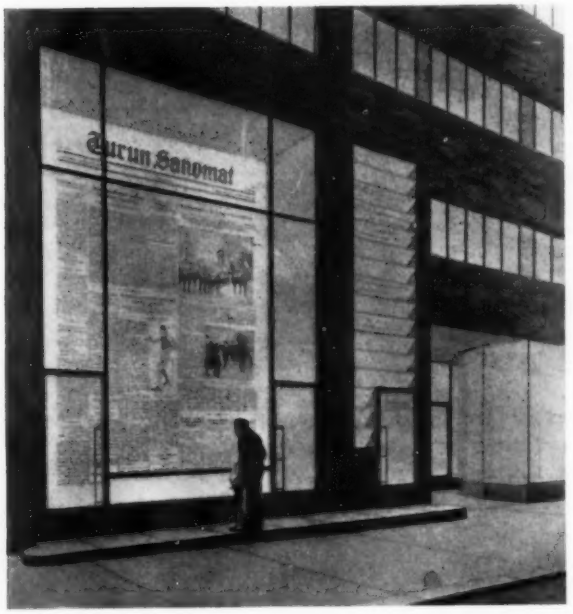
EUROPEAN PLANTS



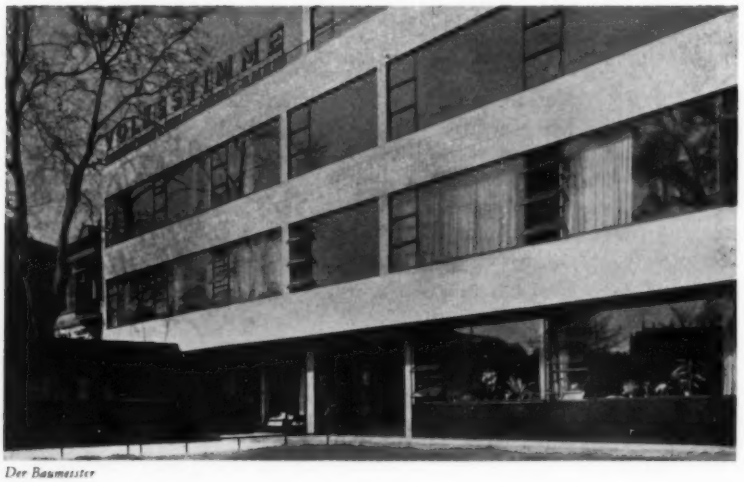
Byggmästaren

MODEL, LITHOGRAPHIC PLANT
STOCKHOLM
IVAR TENBGOM, ARCHITECT

Arkitekten



TURUN SANOMAT, NEWSPAPER
HELSINGFORS, FINLAND
ALVAR AALTO, ARCHITECT



Der Baumeister

VOLKSTIMME,
NEWSPAPER OFFICES
FRANKFURT, GERMANY
ARMIN LEHR, ARCHITECT

RECOMMENDED TEMPERATURE FOR RELATIVE HUMIDITY

Any fixed condition must be a compromise between the several desired conditions. What is best for paper, for instance, may be too high for comfort. When everything is taken into consideration—health, paper, ink, roll and weather—a relative humidity of 55 per cent is recommended by one manufacturer of humidification equipment as the best all-year condition for pressrooms. Another manufacturer suggests a relative humidity of from 40 to 50 per cent in the winter and from 55 to 65 per cent in the summer, with a temperature of from 75° to 85° as optimum. Another recommendation states as a desirable relative humidity 50 per cent from October to April inclusive and 60 per cent from the first of May until the last of September.

In the Chicago *Evening Post*, a constant all-year pressroom temperature of 80° and a relative humidity of 77 per cent give satisfactory results. The air is free from dust, and less paper and ink are used. The health of pressmen is very good.

Except for a few days in the summer the natural indoor humidity in most localities is lower than 55 per cent. This moisture deficit demands humidification for best working conditions. In localities where hot weather is constant, dehumidification equipment is advisable. Very few printing plants now have this.

SYSTEMS OF HUMIDIFICATION

Humidifiers may be divided into three general types according to method of operation:

(1) direct—spraying water into the air where it is rapidly evaporated.

(2) indirect—introduction of moistened air into the room.

(3) combined—direct and indirect.

Evaporation systems

A wet towel on the radiator is a primitive form of air conditioning. Likewise any device depending upon exposure of surface of heated water to air in natural, conductive or forced circulation. Before controllable humidification apparatus was developed one could frequently see water standing in printshops in open pans or open mesh cloth exposed to the circulating air. This system is so low in evaporative capacity that its application is generally unsatisfactory. The surface of water in contact with the air when the water stands in a pan, even as large as 3 feet square, is obviously very much less than when the water is broken up into small particles and each particle is completely surrounded by air.

Atomizers

For the average printing plant the simplest, cheapest wet system is the atomizer type. Water is drawn into the nozzle of atomizer heads and atomized by a small jet of air under high pressure so that the water is broken up into fine particles. The finer the particles of water, the greater the evaporative capacity and the less the precipitation of moisture on machinery and material beneath the atomizers.

In another type, water is sprayed at high pressure to an atomized nozzle located in a sheet metal enclosure suspended from ceiling and through which a current of air passes. A method of baffling separates the heavier particles of water and only the finest particles pass into the room with the current of air.

This system consists of a compressor, receiving tank, after-cooler (sometimes omitted), atomizers or heads, pipe lines for conveying air and water to the heads, either a float tank or pump, depending on whether or not the system uses water under pressure.

An efficient type of humidification for press and reel rooms has been developed by the Chicago *Evening Post*. Atomizing heads operating with steam, or water and air, are located under paper web of presses and in aisles between presses. The system is under control resulting in a constant humidity throughout 24 hours a day. Graphic records are kept of the temperature and humidity, which average 80° and 77 per cent.

Ease of cleaning, permanency, accuracy of construction, suitable material for heat, quality of workmanship in installation, possibility of inspection and repair service are factors to be considered in selecting an atomizer system. The action should be satisfactory and positive to prevent wetting-down. If the air is shut off at a distant point from the heads and no provision made to relieve pressure in the lines rapidly, precipitation will occur.

Centrifugal humidifiers

This system breaks up the water into fine spray by mechanical centrifugal force. A small jet of water is thrown on a disk rotating at high velocity within a saturated circular cone consisting of fine metal strips or teeth, against which the water thrown from the disk impinges. A fan forces air through the finely atomized particles of water.

Centrifugal humidifiers are good for small installations. They are self-contained and require only connection to the lighting circuit, water spray and the drain. Good distribution of moisture is maintained. Capacity, however, is lower than in other types of humidifiers and power consumption is high. An excess of water is thrown off from the disk and runs to waste unless it is returned to a tank to be filtered and recirculated by a pump as in the best systems. One type catches the water at the head and returns it to the disk directly; this type requires only a water spray connection.

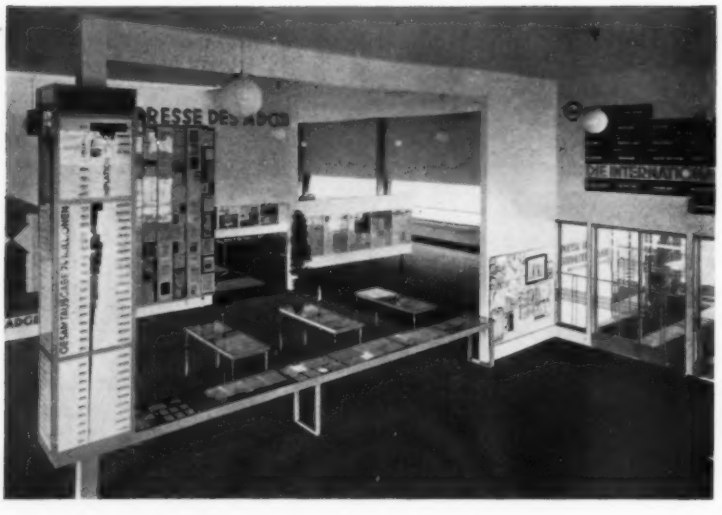
The centrifugal system presents a high cost of operation and is not so easy to control efficiently and

EXHIBITION ROOMS

COLOGNE, GERMANY

HANS SCHUMACHER, ARCHITECT

Werner Mantz



Reading, lecture and display rooms of associated German workman's newspapers and trade journals. Visitors seeking information may come here to consult periodicals—an illustration of relationship of the publishing plant to community.

effectively as some other types. These factors are offset, in small installations, by the lack of accessory equipment and by simplicity of installation.

Nature of spray, possible air circulation, ease of cleaning, accuracy of the construction, quality of workmanship in installation, possibility of inspection and repair service are factors to be considered.

Central station

The direct humidifiers do not provide either for control of ventilation or for dehumidification, which are essential for industrial operation and for human comfort. In the central station system a chamber located outside the room tempers the air both in temperature and humidity and delivers it by ducts to desired outlets. Such a system makes possible any desired atmospheric conditions. Ventilation, heating, humidifying, including refrigeration apparatus, dehumidification and cooling are controlled.

A central station system is in most cases more expensive than the other types and should be used only where it is necessary to maintain conditions which cannot be obtained otherwise.

Frequently an elaborate central station system is installed to remedy conditions which occur only on very few days of the year. Weather bureau statistics should be studied to determine the real need for the added features of this system. The extra cost must be balanced against the benefits derived on those days when such features are needed.

SYSTEMS OF DEHUMIDIFICATION

In many cases it will be found important to control the temperature and relative humidity in summer as in winter. In winter the air must be warm and the humidity increased. In summer the air must be cool and moisture content reduced so that both temperature and humidity may be kept constant regardless of outside weather conditions, and of conditions within the plant itself.

Dehumidifiers are of two general types:

(1) Spray type in which the water is cooled outside of the spray chamber and then introduced.

(2) Type in which water is sprayed over the surface of refrigerating coils directly into the spray chamber and the air comes into contact with both the wetted coils and the spray.

Usually dehumidification systems are provided with a dew point control at the apparatus and also a control within the room by either a thermostat or a hydrostat.

UNIT AIR CONDITIONERS

In recent years several manufacturers have put on the market unit air conditioners, small semi-portable central stations. The heater is composed of the heating element enclosed by a casing over whose surface pans draw fresh air and discharge it in selected directions. Some are equipped with automatic temperature and humidity controls, becoming entirely automatic in operation.

Unit heaters are designed to circulate the air at a rapid rate, give a humid temperature, direct rapidly and effectively the heated air, simplify piping and installation, increase capacity of the heating surface by passing the air over it at high velocity, and to control readily the room temperatures manually or by thermostats. They are easily set up and can be moved from place to place.

The unit heaters are well suited to establishments not operating in large rooms. In general, for large rooms a central station system properly designed may be relied upon to operate at lower cost per unit of capacity than an aggregation of relatively small self-contained units.

Conditioning units are particularly good for plants requiring definite air temperature and humidities in various rooms. Trouble with one unit does not cripple other units. Where dust and lint occur, units require frequent attention and cleaning. For dehumidification the A. S. H. V. E. recommends the central station system where more than three unit conditioners would be required.

GENERAL CONSIDERATIONS

Selection and installation of air conditioning equipment requires early consideration with qualified engineers.

The number of employees, the power used, and even the orientation of the building are necessary considerations. The type of window glass may affect radically the control of the relative humidity. Sunlight coming in through windows may raise the room temperature rapidly and thus upset the humidity control. Double glazing and condensation gutters are frequently required. Provision for these requirements should therefore receive early consideration in the planning of the plant.

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FLOORING

Floors should not be fatiguing. At the same time the floors must be able to withstand trucking, acids and severe treatment from accidental dropping of heavy weights. They should be easily cleaned and repaired if necessary, and proof against dust, water, acid action and slipping.

Many printers object to concrete floors as having an affinity for moisture which causes their feet to swell with much standing. Consequently they frequently stand on rubber mats. An untreated concrete surface gives off a fine dust which disturbs the quality of printing and it becomes necessary to paint the floor frequently. These objections can be met satisfactorily by the use of integral surface hardeners. The joints also should be laid diagonally rather than square to the truck routing and filled with asphalt to avoid chipping if not chemically hardened.

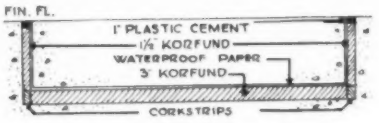
The usual alternatives to concrete are mastic or wood block flooring. These provide a softer finish. Mastic, however, becomes ribbed and uneven under trucking, and thus difficult to clean. In the McMath plant at El Paso, Texas, the concrete floors were covered with asphalt to give a springy resiliency, but it became necessary to remove the asphalt on the trucking passageways. Wood blocks with the end grain forming the surface are resilient, sound-absorbing, and have a lasting smoothness. They are more expensive than either mastic or concrete flooring and when laid on ground floors call for an absolute waterproof medium between the blocks and the floor base to prevent dampness and subsequent swelling and buckling.

A double wood flooring has been found satisfactory in small job plants. The first flooring is nailed to oak planks embedded in the rough concrete at proper intervals and the finished flooring then laid cross-wise. The presses are placed either on the oak planks or on planks bolted to the double flooring. For wood floors there should be a sheet of zinc under each press to catch oil and grease.

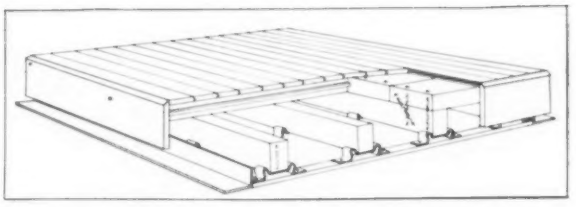
Where concentrated acids are encountered, vitrified brick with tar joints or an alberene stone floor laid on a 5-ply blanket of fabric and asphalt to form a waterproof base can be used. Where dilute acids are encountered, metallic concrete floor hardeners have been recommended.

Where used plates are stacked in the stereotype room to be resmelted, the floor should be strengthened with an arrangement such as a feralun steel plate surface set in the concrete slab.

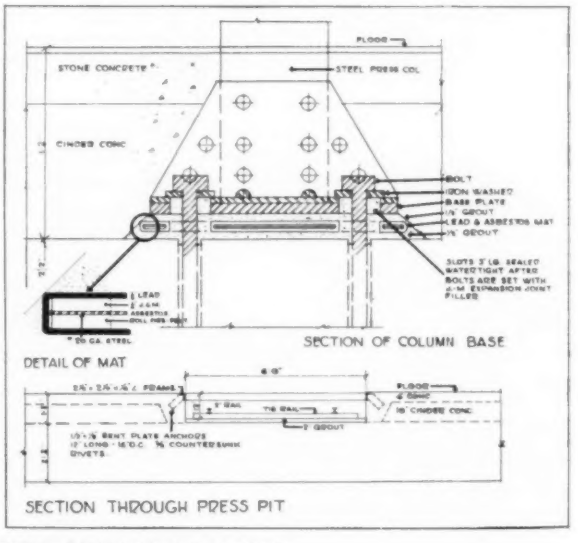
For areas around machinery the floor should be made proof against slipping. Graphite, especially when it comes in contact with concrete, makes the floors very slippery. Metallic floor hardeners are suggested for such conditions.



INSTALLATION OF KORFUND
PITTSBURGH PRESS



VIBRATION PROOFING OF PLATFORMS BY RESILIENT SPRINGS
U. S. GYPSUM COMPANY



DETAIL OF VIBRATION PROOFING
NEW YORK DAILY NEWS
LOCKWOOD GREENE ENGINEERS, INC.

VIBRATION PROOFING

Vibration can cause much trouble with presswork. Quads, spaces, leads and furniture work out of place and plates become loosened if the vibration is not controlled. In dressing castings, for instance, the work must be as close as half of 1/1000″, to accomplish which there can be no vibration. To obtain perfect register of colors, to prevent slurring of the fine dots on halftones, and to minimize wear on the presses, there should be no vibration. Furthermore, for obvious reasons, vibration should not be transmitted to other parts of the building.

Presses are sometimes staggered in plan so that any tendency to set up a swaying motion by synchronization will be counteracted. This is not always feasible and frequently not all the presses will be operating at once to achieve the desired result.

Where presses rest on ground floors, vibration is usually absorbed through foundations separate from those carrying the building loads. Sand bed fills for individual pieces of equipment are sometimes used.

The Milwaukee *Journal* presses have separate foundations on piles and spread footings. One row of press supports overlaps the building footings which support but are isolated by a mat of creosoted poplar encased in sheet lead. This mat is on top of the building footings and below surface water level. Results have been good.

The Goss Printing Press Company recommends as best practice for vibration proofing of press installations either (1) a layer of Korfund placed under the whole area covered by the press and surfaced with a reinforced concrete slab at least 18″ in thickness, or (2) lead asbestos pads placed under the individual columns of the press foundation.

In the Chicago *Daily News* plant, a 2″ layer of Korfund was inserted around the vertical sides of the foundations and the columns, and a 3″ layer of Korfund placed over the bottom of the pit. The press foundations are poured directly on the Korfund, which completely isolates them from the rest of the building. In the Oklahoma Publishing Co., plant a 1½″ Korfund mat was used over the ground slab, the load of the presses being carried on the ground instead of by the building structure.

In the Toronto *Star* press isolation was satisfactorily accomplished with 1½″ thick Armstrong machinery isolation cork, heavy density.

In the New York *Daily News* plant the problem of eliminating vibration was solved by the use of a reinforced concrete slab designed not for strength primarily but for sufficient mass to absorb the vibration of moving parts. The presses are supported by lead and asbestos insulating mats on the reinforced concrete slab which is 26″ thick. On this is a blanket of cinder concrete, covered by a stone concrete finish for the floor. This fill accommodates electric conduits and aids to deaden vibrations. Care should be taken that cinder concrete does not come in contact with any ferrous metal which will be rapidly corroded.

The U. S. Gypsum Company has recently developed a new type of vibration proofing, based on the principle of providing a resilient steel spring between the source of vibration (or sound) and the structural members of the building. This spring base has been recommended by the Miehle Printing Press Co.

The Johns-Manville Company has also recently entered the field of vibration-proofing with anti-vibration platforms for installation under linotype machines and small printing presses where the maximum load is not more than 330 lbs. per sq. ft.

Tests have been made by Frank D. Chase, Inc., engineers, to determine the relative absorption of sound of four different classes of isolation materials for use under printing press foundations. The materials tested:

1. *Natural cork* (1½″ thick, 6″ x 6″, loaded to 20 lbs. per sq. in.)
2. *Lead and asbestos* (lead ⅛″, asbestos 3/16″, lead ⅛″, 4½″ x 4½″, loaded to 50 lbs. per sq. in.)
3. *Lead, asbestos and steel* (lead ⅛″, asbestos 7/32″, steel ⅛″, asbestos 7/32″, lead ⅛″, 4½″ x 4½″, loaded to 50 lbs. per sq. in.)
4. *Balsa wood* (3″ thick, 6″ x 6″, loaded to 20 lbs. per sq. in.)

Each material was loaded to its normal working capacity under a steel bearing plate which carried a suitable load of pig lead. Sound was created by a standard air hammer and reciprocating electric hammer direct to the steel bearing plate over the material. Sound was observed in the frame of the building two stories below and audibly detected through a standard stethoscope.

Two materials were loaded and the sound applied alternately to each and direct to the floor so that relative degrees of sound could be noted. One material was then changed, the tests repeated, and this in turn until the relative difference of each had been compared with the others. The results, the engineers point out, are only approximate, inasmuch as the volume of sound was determined by the differences detected by the ear. The test with scientific instruments would be, of course, more accurate.

Relative sound transmitted direct to floor was taken as loud (100%). Relative sound through lead, asbestos and steel was then determined as medium loud (approx. 60%); through lead and asbestos as medium (approx. 50%); through Balsa wood as medium dim (approx. 20%); and through natural cork as dim (approx. 10%).

STATIC ELECTRICITY

Changes in temperature and humidity conditions are chiefly responsible for static disturbances. While air conditioning will reduce the accumulation of static, it does not, however, remove its presence.

Neutralizers are often necessary to get rid of accumulated static. Especially is this the case in rotogravure printing where the fumes from the inks are highly inflammable and as the copper printing cylinder and the rubber impression roll with the paper between are generators, the static builds up until it discharges to the nearest ground, very often causing flash fires.

ILLUMINATION

Since many printing plants operate both day and night, proper artificial illumination is needed to augment or to replace daylight as it fails. The skilled operators are using their eyes continually on close and careful work which, unless provided for, will cause eyestrain and impaired health. The importance of eye infections as a prevailing ailment has already been noted. Poor illumination is responsible for low efficiency, accidents, low production and a high rate of spoilage.

Ground floor plants with overhead sawtooth roof construction offer a maximum of daylight without glare or shadow. North light is particularly desirable for composition, art work, color matching and printing. It is, of course, not always obtainable. But glare, either direct or indirect, should be avoided. Sunlight streaming in through windows should be subdued with shades of buff or white linen, or white artist's cloth. Windows of ribbed glass assist to diffuse the light where desired and do not require shades.

Proper painting of the interior will assist in diffusing the natural daylight. By actual tests undertaken by various electrical engineers it has been discovered that buff reflects light better than white and is much more comfortable to the eyes. To conceal fingerprints there should be a dado of a darker color—bronze green, dark gray, dark olive green, hospital green or dark brown.

Drop lamps at eye levels are to be avoided. No cords should be dangling over the imposition tables. All lights should be spaced to give a uniform illumination where needed. In particular, units should be placed over each compositors' stand, type cabinet, imposing table and over the inspection tables near the delivery end of each multicolor press.

"Standard" daylight is difficult to determine. In winter daylight becomes dark in value early in the afternoon. Storms and passing clouds also affect daylight. Its color is always changing, owing to either atmospheric conditions or to the reflected light of neighboring objects.

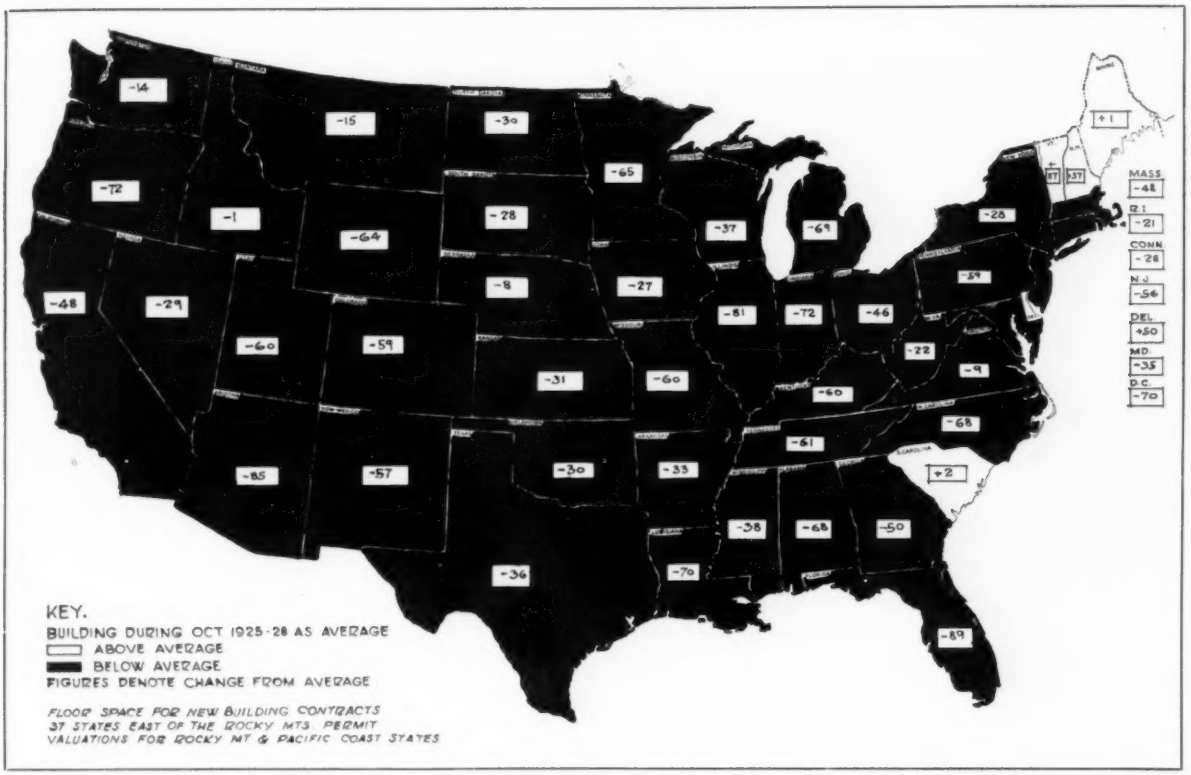
A uniform intensity of artificial north light is more desirable for color matching and multicolor printing than genuine north light. Special daylighting lamps are on the market. Such is the Mazda C Daylight, furnished with suitable reflectors and special filters to give a strong diffused white light. Mercury vapor or Cooper-Hewitt lamps are recommended by many engineers and printers, but others object to the sickly appearance which these lights give to those working under their illumination. Glassteel diffusers and control lenses such as Holophane have been found satisfactory.

The need for research is apparent. At the convention of the Illuminating Engineering Society, held at Richmond, Va., in October of this year, ocular strain was given much consideration. The subject is complicated by physiological and psychological factors which have not yet been reduced to exact measurements. The light reflection factors of acoustical materials, which have a high light absorption, must be considered. Likewise all the substitutes for sunlight, including the ultra-violet rays.

One paper presented before the society by M. Luckiesh and F. K. Moss called attention to the fact that "seeing meters" must be established to determine the quality and quantity of light. *Lighting plus vision equals seeing:* higher levels of illumination enable smaller objects to be seen.

Eyes function only a fraction of the total working time, in split-second intervals. Hand movements, more or less automatic, consume the rest of the time. What can be done to conserve eyesight is a fruitful field of research for the lighting engineer. Much is being done. Tests have been undertaken by Kwan Y. Tang, instructor of electrical engineering at Ohio State University, to compare the rapidity with which a detail of a test object could be perceived under various levels of daylight, incandescent and mercury vapor illumination, alone or in combination. These tests indicate that daylight is the most satisfactory source of illumination, and that next to daylight a mixture of all three illuminations is most successful.

Industrial illumination also suggests the possibility of providing hygienic conditions for both the eyes and the body from ultra-violet transmission. The S-1 lamp, a device combining artificial illumination with the desirable ultra-violet of the mercury arc spectrum, was recently introduced commercially. The Cooper-Hewitt glass tube lamp contains a sufficient amoung of ultra-violet and also has the advantages of containing no wave-lengths short enough to produce deleterious effects on the eyes. A new type of ultraviolet lamp, which can be combined with artificial illumination, is described in another paper by J. W. Marden and M. G. Nicholson, Westinghouse Lamp Company. This lamp is of the low-pressure mercury glow discharge type.



The October building map showed no important changes from the conditions reported in September, though better current new building in New Hampshire, added to continued improvement in Maine and Vermont, indicated a contiguous area in northern New England that was above average (October, 1925-1928).

BUILDING TRENDS AND OUTLOOK

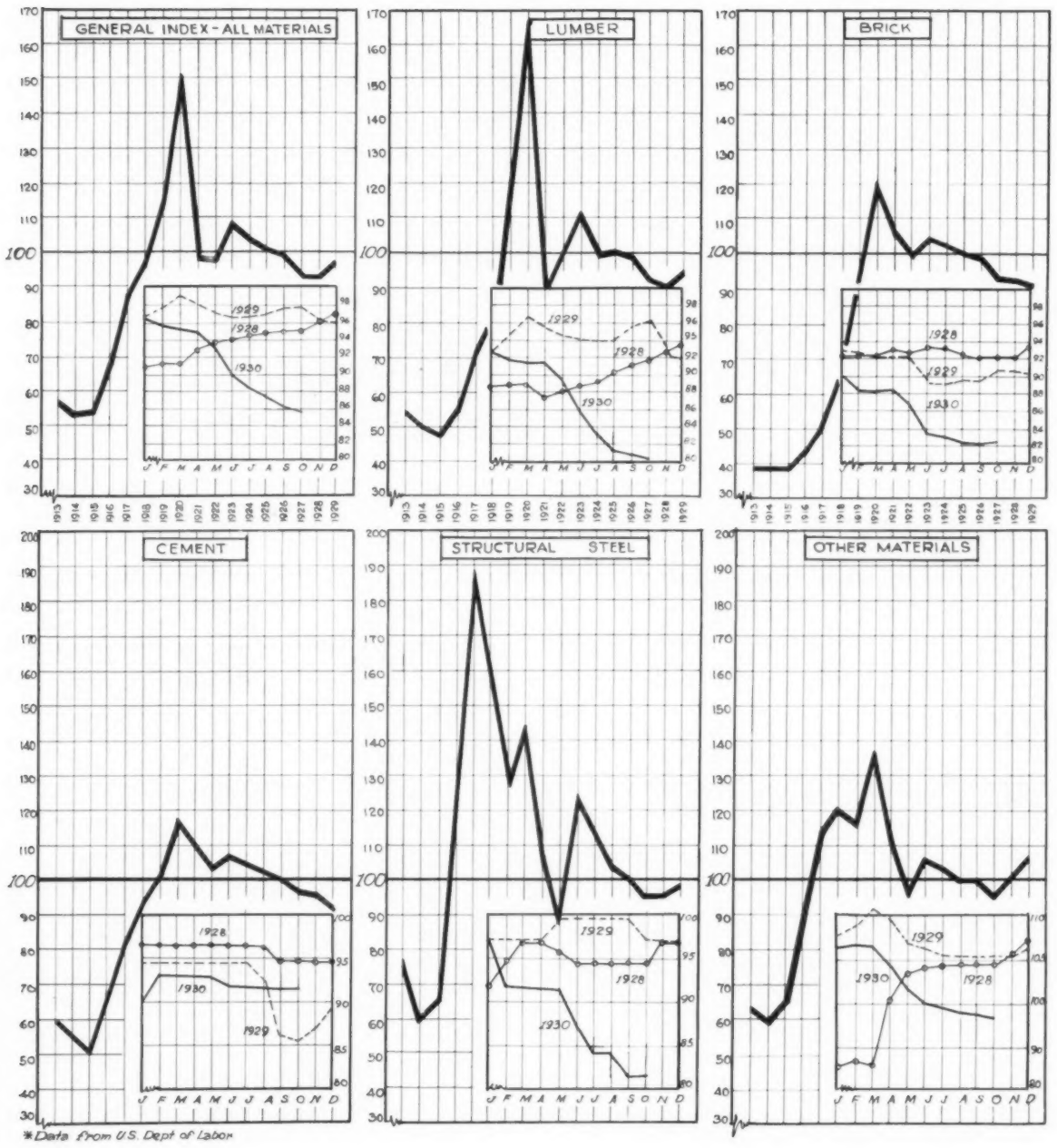
THE ARCHITECT AND CONSTRUCTION ECONOMICS

The architect who plans without regard for construction economics, prospective labor and material costs, land values, financing, technologic improvements, shifting centers of commerce and habitation, taxation, rentals—must go the way of the physician who prescribed before diagnosis. Too willing have we been to accept our plight as an unavoidable phenomenon, too willing to ascribe the causes to the stock market debacle or to tight money, high wages, high material prices. Yet the antitheses now with us have not provided the looked-for improvement. Even though small in numbers the architectural profession is a key one when compared with our other professions. It ministers to the most basic of all manufacturing industries, for building in its true sense is a manufacturing process. All business and industry awaits a prognosis from the building industry. Architects, individually and collectively, are providing this prognosis if we may judge from their growing interest in their own problems. Vertical transportation which has made the skyscraper possible is being adapted to residential requirements. And in the offing even larger apartment houses, with community gardens, swimming pools, tennis courts, and the like seem presaged. Fabricated units, under the direction of the architect, will make possible the erection of more livable small houses, better in construction, at substantially lower unit costs, operating to make obsolescent the row house of an earlier day. Though standardized, these units will be fabricated with due regard to the important matter of community grouping. In this movement the pitch roof will give way to the flat roof terrace with solarium, and glass may become a more important material. These are merely indicative of a tendency towards greater improvements in architecture and

(Continued on page 90 advertising section)

WHOLESALE PRICES FOR BUILDING MATERIALS

1926 Monthly Average = 100



*Data from U.S. Dept of Labor

The general index of building material prices of the U. S. Department of Labor showed a still further decline in October but the rate of decrease seemed somewhat arrested. Of the individual materials lumber showed the principal decrease; brick recorded a gain as compared with the preceding month; while cement and steel were unchanged from September.

It is variously estimated that construction costs in general are from 13 to 20 per cent below prevailing costs a year ago if due allowance is made for increased productive efficiency on the part of building tradesmen. In the meantime money for needed building projects is plentiful and interest rates remain low.

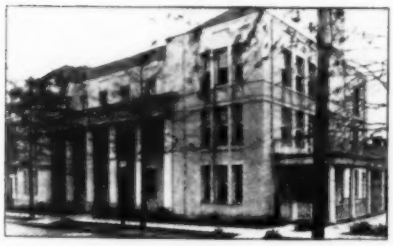
Applied six years ago . . .
Washed twice a year since . . .
Lustre unimpaired

Cambridge Arms, Charles, 34th and St. Paul Streets, Baltimore, Md.—a property of The Guilford Realty Company. All seven Guilford Apartment Houses here shown are painted with Barreled Sunlight.

Readily tinted any desired shade with ordinary colors in oil. Quantities of 5 gallons or over are tinted to order at factory without extra charge.

First Guilford Apartment House painted with Barreled Sunlight

Three more Guilford Buildings all painted with Barreled Sunlight



Dundee Arms

Essex Arms

Berkeley Arms

IMPRESSIVE enough when this prominent Baltimore real estate operator specifies Barreled Sunlight for six apartment houses and an apartment hotel.

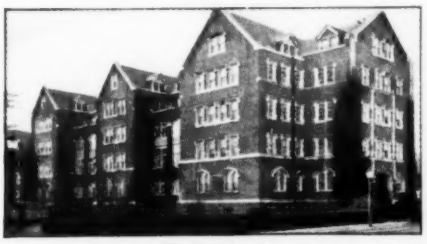
Doubly impressive when such standardization is the result of six years of satisfactory performance in the first of these—the Cambridge Arms.

The reasons for this preference are outlined in a letter too long to reprint. Extracts, however, tell the story:—"washed in some instances twice a year . . . lustre unimpaired . . . the general appearance truly wonderful."

Though our complete catalog is in Sweet's, we'd like to supply more detailed information for your own personal files. Please mail the coupon.

U. S. Gutta Percha Paint Co., Providence, R. I. Branches or distributors in all principal cities. (For Pacific Coast, W. P. Fuller & Co.)

Another Guilford Apartment painted with Barreled Sunlight



Tudor Arms

Two more Guilford Buildings also painted with Barreled Sunlight

Wentworth Arms

1001 St. Paul St. (Apartment Hotel)

U. S. Gutta Percha Paint Co.,
22-L Dudley Street, Providence, R. I.

Please send me your booklet, "Information for Architects," and a panel painted with Barreled Sunlight. I am interested in:

Gloss ☐ Semi-Gloss ☐ Flat ☐

Name_____

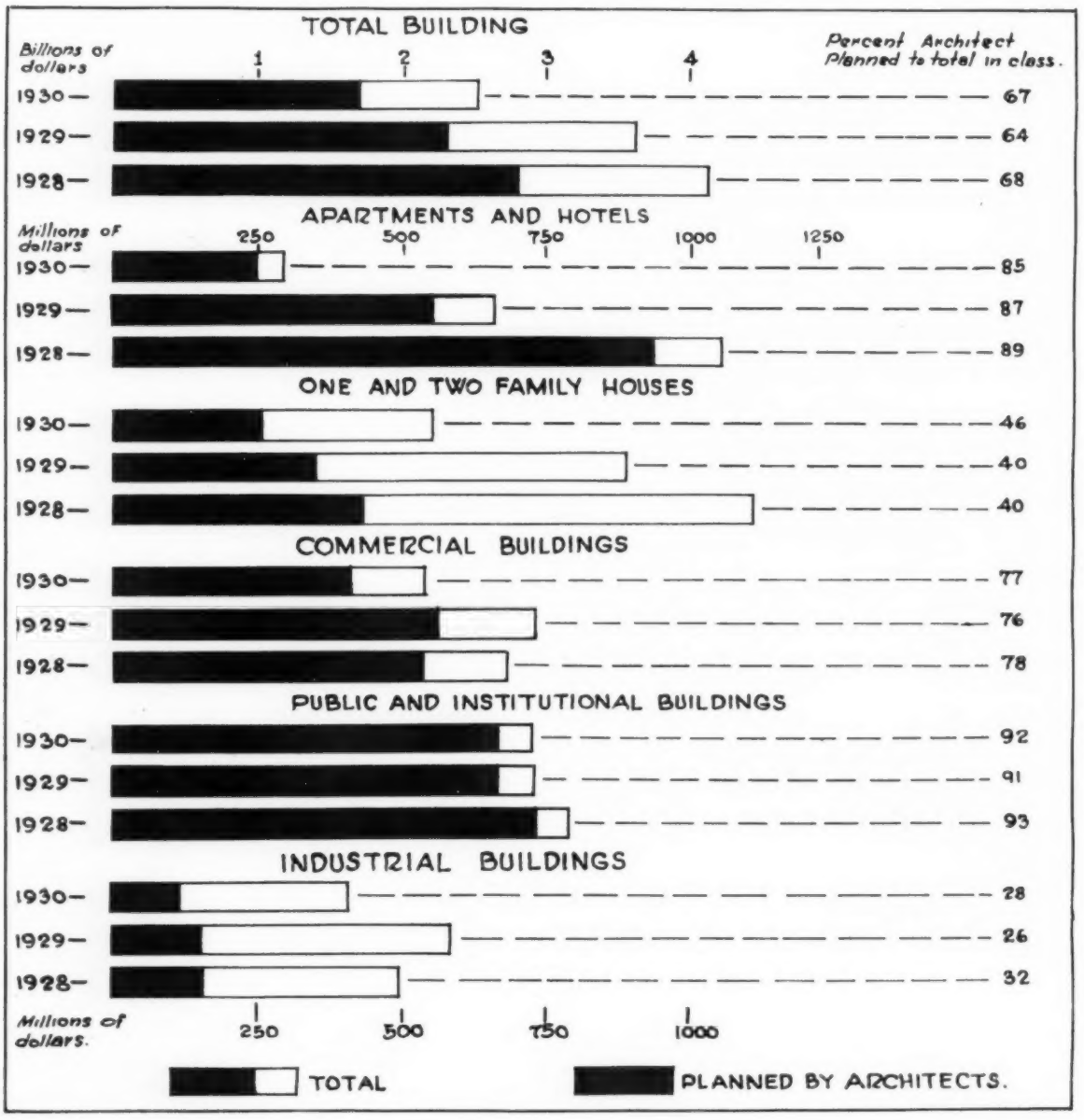
Street_____

City_____ State_____

BUILDING CONTRACTS IN 37 EASTERN STATES

First nine months 1930 with comparisons for corresponding periods of 1929 and 1928

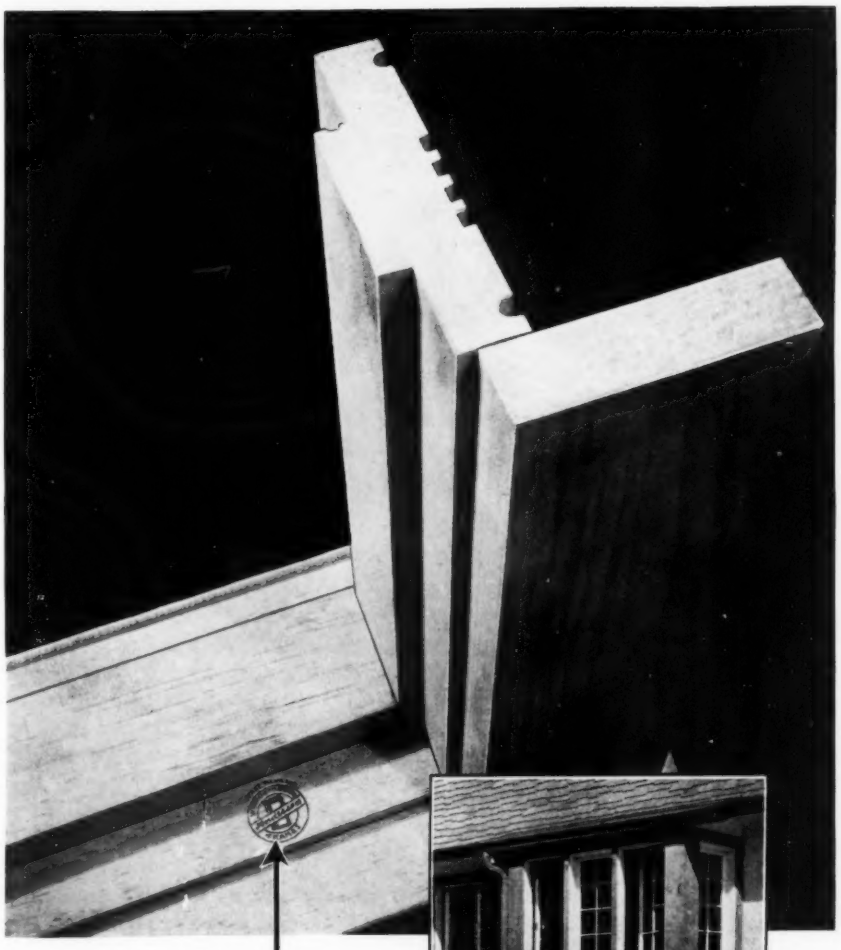
SHOWING, BY PRINCIPAL TYPES, RELATIONSHIP BETWEEN VALUATION OF ALL BUILDING CONTRACTS AND THOSE WHICH WERE ARCHITECT-PLANNED



Though new building showed a drastic curtailment during the first nine months of 1930 when compared with the corresponding period of 1929, work planned by architects has shown a relative gain in importance over 1929. Each important class of building participated in the relative improvement except apartments and hotels which showed architect-planned work with a lower percentage to total apartment and hotel building than was registered in 1929. The percentage of all work done by architects during the nine elapsed months of 1930 showed a poorer condition than was reported for the corresponding period of 1928, increased relative importance of architect-planned one and two family houses being somewhat more than offset by declines recorded for apartments and hotels, commercial, public and institutional, and industrial buildings.

NOTE: Public and institutional buildings include such architect-planned buildings as are reported under public works; other public works construction is not included since this type of construction is principally civil engineering.

New locked sill-joint is one more reason why architects specify "Andersen" . . . .



New Andersen Master Casement, inswinging or outswinging. Note trade-mark die cut in the sill.

ANDERSEN'S new Master Frame with the new patented weathertight features already has won first rank with architects. They like the locked sill-joint, the wide blind stop provision, the accurate millwork and the beauty of the genuine white pine which lasts a lifetime.

Also, they know that builders cut labor costs with this new frame. Andersen Master Frames are made so accurately that builders make one operation of fitting all sash and cutting all trim at the bench. Have you received your copy of Andersen's new catalog, No. 500? Write for it.

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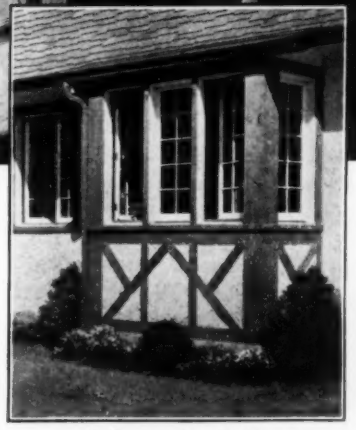


Andersen inswinging Casement installation

Andersen MASTER WINDOW and DOOR FRAMES Frames

FOR WEATHERTIGHT INSTALLATIONS—USE ANDERSEN SPECIFICATIONS

(*Continued from page 524, Editorial Section*)

measurable changes in the utilization of materials.

The architect is as truly the building designer as the automotive engineer is the automobile stylist. His is the problem of changing and improving the character of architecture so effectively as to make obsolete existing structures; his is the problem of providing better and more livable habitation, more efficient offices and school buildings. It is indeed no easy matter, but in times such as these, when staffs are not under pressure on current plans, unexcelled opportunities are present for the development of efficiency that must bring about a much more methodic evolution in architecture in the light of construction economics than has obtained hitherto.

An examination of the accompanying chart at once discloses the position of the architect in building or what is more significant to him, the large importance of private plans. For all types of building, architect-planned projects have averaged less than 70 per cent of total new building even during the years of largest building volumes, with private plans representing more than 30 per cent of the total. Private plan work, which has bulked very large in one- and two-family houses, provides an answer, though by no means the only one, for the helter-skelter, hit or miss developments which were so prolific during the past few years; shelter—but at what price!

Shelter represented by apartments and hotels, on the other hand, has been most largely architect-planned, but even here a considerable amount of building still is from private plans, more especially in smaller apartments. For the first nine months of 1930 architect-planned apartment houses and hotels were less important relative to total new building projects of these types than in either the corresponding period of 1929 or 1928, which would seem to indicate an increased relative amount of small apartment house construction from "stock" plans. At the same time architect-planned one- and two-family houses showed a large gain in importance when compared with 1929 or 1928, reflective of the less drastic curtailment in the more expensive types which customarily are entirely architect-planned.

Commercial building types planned by architects during the first nine months of 1930 have shown only slight change in importance when compared with either the preceding year or the corresponding nine months of 1928. For the nine elapsed months of 1930 architect-planned commercial buildings were 77 per cent of the total and compared with 76 per cent in 1929 and 78 per cent in 1928.

Public and institutional building has for the most part always been architect-planned. Architect-planned work in this class for the first nine months of 1930 showed a percentage of 92 to the total for the class, as against 91 per cent in 1929 and 93 per cent in 1928.

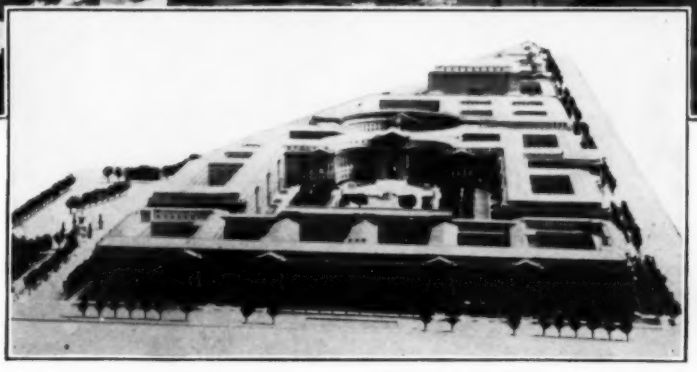
Industrial building planned by architects showed only 28 per cent of the total for the class during the first nine months of 1930; in 1929 the ratio of architect-planned work was 26 per cent while in the corresponding nine months of 1928 the ratio was 32 per cent. This class of building is principally planned by engineers, hence the low percentages for architect-planned projects.

It is upon non-residential building that architects seem to have centered their energies for improvement in design, efficiency in operation, economies in production. With an indicated further decline in this type of building activity because of the known large oversupply in office space, it would appear that the attention previously directed to non-residential building may now well be diverted toward improvements in residential types, to make houses more habitable, to make dwelling units more efficient. In these processes residential building will find basic soundness for continued improvement, for it is not more housing that is needed but rather better housing. The best way to create a demand for new housing is to produce better housing for less money.

What is being done in this direction is evidenced in apartment house construction in the outer fringes of some of our industrial cities. But development along these lines operates to add dwelling units without material displacement of existing units. The bigger problem involves, it would seem, displacement of obsolescent, walk-up tenements in our slums and near slums which have outlived their economic utility; the rebuilding of existing centers rather than further horizontal extension unless such extension involves some displacement. Here the architect can do no more than advise, but coordinated effort in this direction, with growing recognition of the problem on the part of real estate interests, zoning commissions and financing agencies, tangible results may soon appear. Shelter still is one of the basic needs of civilization. New and better shelter at lower costs can produce a whole train of productive processes in mine and forest, industry and commerce that will restore equilibrium to our complex business machine.

These processes, as cause and effect, will reestablish the architect on an even higher plane in the industry which more than any other, except agriculture, has been fundamental to economic well-being. Out of this must come better design; superior economic utilization of land, environment, materials; and a fuller realization of the possibilities of an untapped housing market. Such will reawaken dormant financial interests—the insurance companies, our savings banks, our mortgage houses and building and loan organizations, to say nothing of private capital of individuals. These reservoirs of money, now brimful, will be released to one single utility which more than any other can restore the balance to our economic machine that has been upset largely by ruthless excesses of which shelter at any cost was not the least impelling.

L. Seth Schnitman



Internal Revenue Building, Washington, D. C. Treasury Department, Architects. James A. Wetmore, Acting Supervising Architect. James Baird Company, Builders. Built largely of Variegated Indiana Limestone.

(Right) Architectural model of group of buildings included in Government's building program, which it is estimated will involve a hundred million dollars exclusive of land for sites, etc.

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Indiana Limestone Selected for First of New Government Buildings

THE first building in Washington's hundred million dollar construction program is constructed almost entirely of Indiana Limestone. This newest addition to the city's fine architecture emphasizes again the importance of materials in achieving the result you are after. It is proof anew that the fine-grained, light-colored stone from the hills of southern Indiana is considered by the architectural profession as suitable for the most noteworthy buildings of modern times.

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ILCO Limestone, from the proven, time-tested quarries of Indiana Limestone Company, provides the high quality limestone required for modern building.

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VITROLITE crystallizes the dream of the "*Modern*"

The new Arkansas Theater, Little Rock, Ark., pictured above, has a Vitrolite lobby. Standard black ashlar wainscoting, capped by four bands of polished aluminum, forms a striking contrast to the indirectly illuminated silver leaf walls above. Architects, Petter & McAninch, Little Rock, Ark. Contractor, Gordon Walker, Little Rock, Ark.

BEAUTY? Yes, startling beauty. Combine this inherent quality of Vitrolite with its many other advantages, and the reason for the thousands of new Vitrolite installations is supplied. But Vitrolite is "friendly" to the "architect," because it crystallizes modern thought. In shape and color it is adaptable. It is in itself the very spirit of a new era in architectural conception.

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Where Tradition Is a Guide, Not a Master

First Baptist Church, Evanston, Ill.
Architects: Talmadge & Watson
Woodworkers: A. T. Rydell, Inc.

Tradition is a guide but not a master to those architects who have learned for themselves the merits of American Walnut in the decoration of church interiors. Just as they have forsworn the gloominess of candle-light in favor of modern lighting, they have substituted the mellower, softer beauty of American Walnut for the harshness of the materials employed by designers of the distant past.

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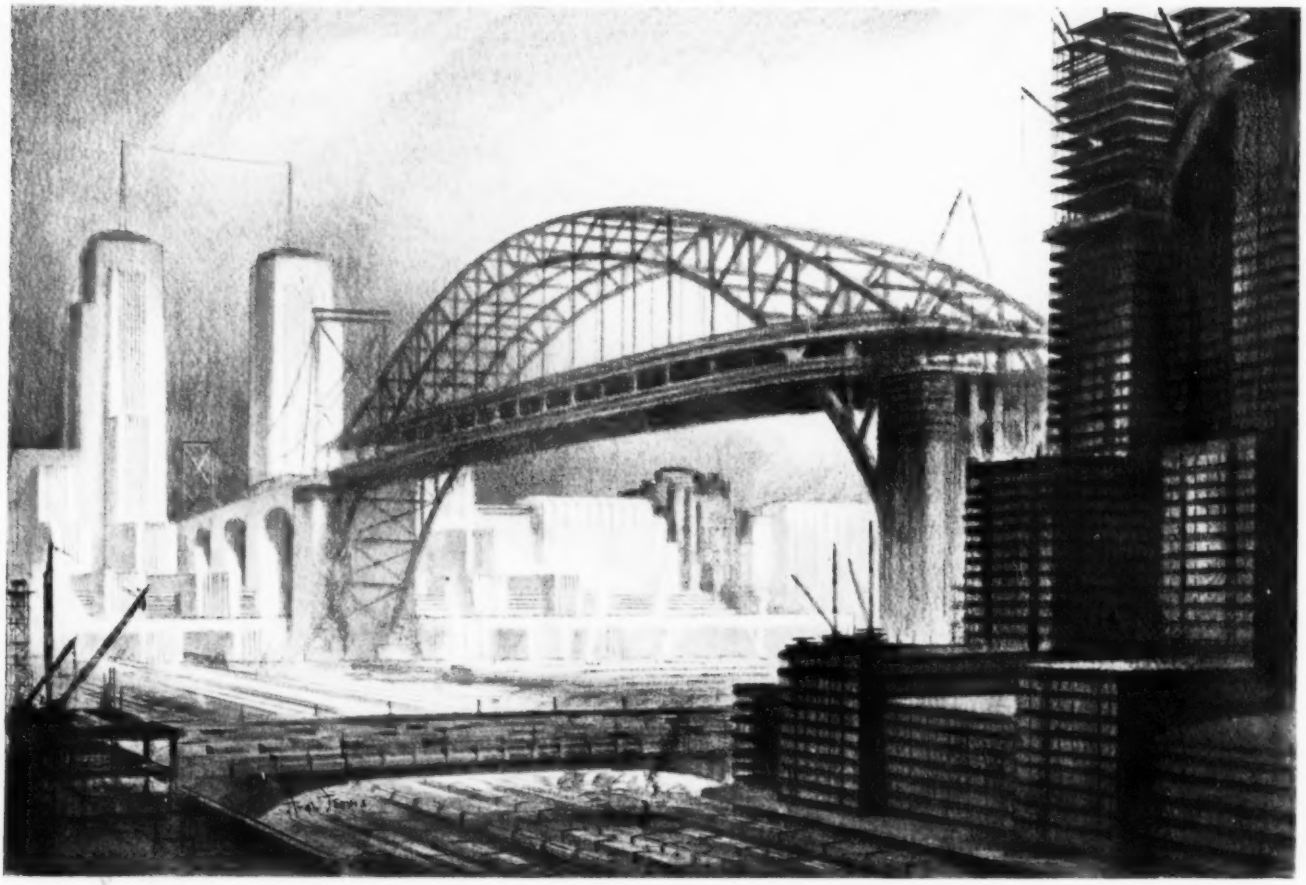
STRUCTURAL STEEL CREATED THE SKYSCRAPER

TO INDUSTRY STEEL BRINGS BRAWN



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AMERICAN INSTITUTE OF STEEL CONSTRUCTION

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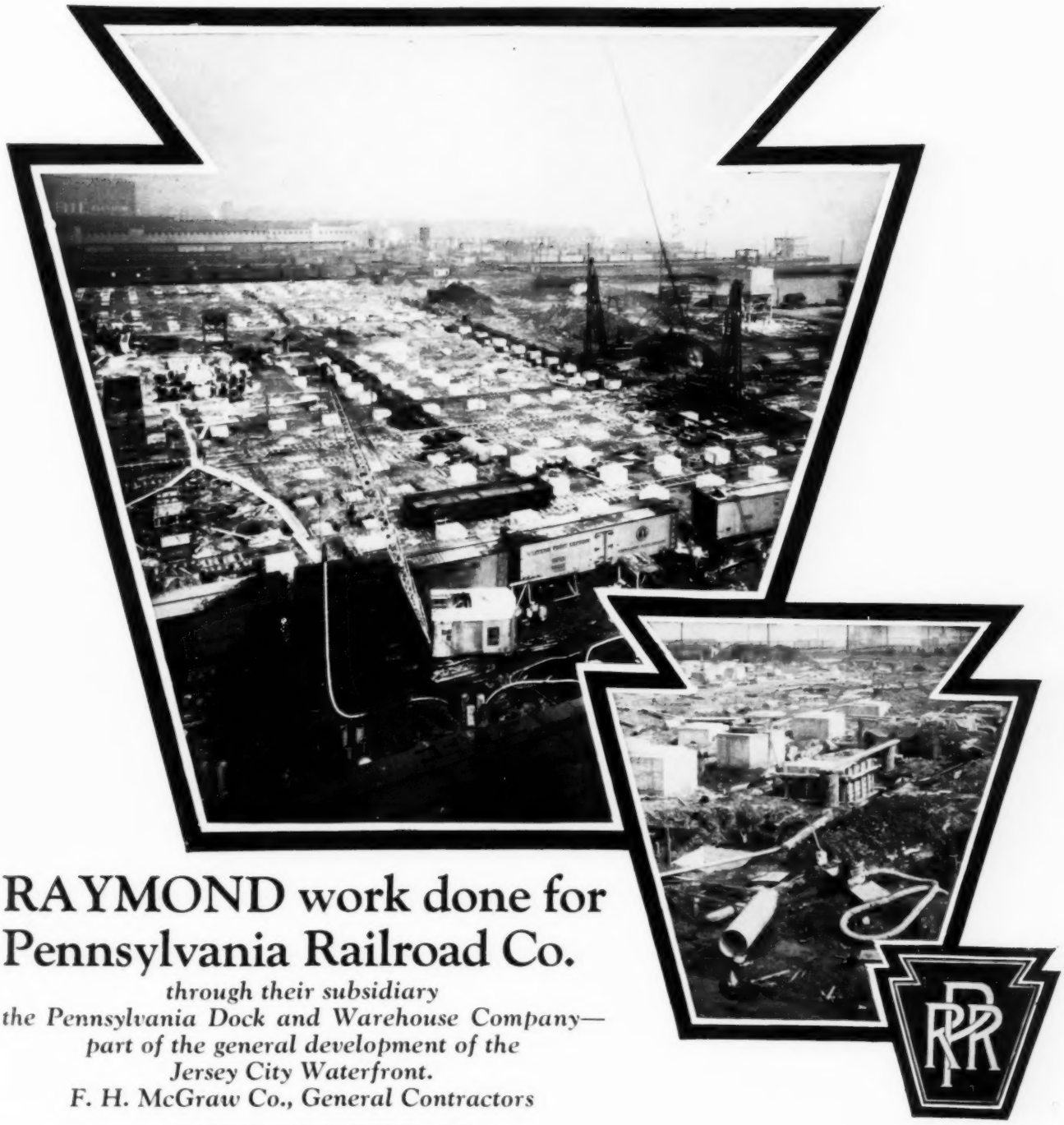

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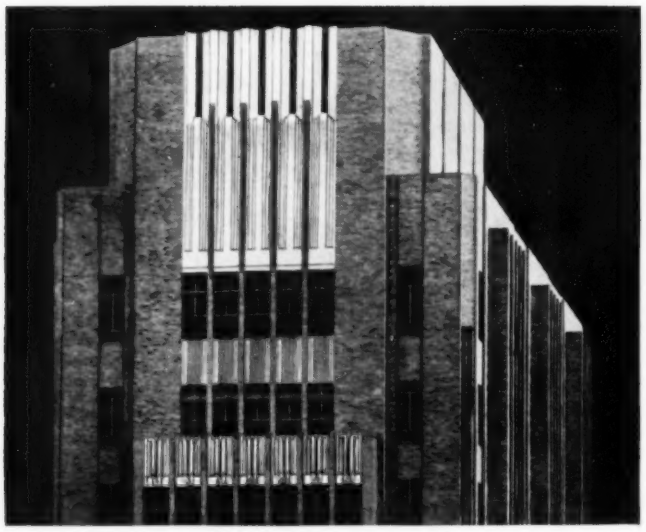

The 1616 Walnut Street Building in Philadelphia is another "Greenberg Project." Architects: Tilden, Register and Pepper, Philadelphia, Pa. General contractor: Wark and Co., Philadelphia, Pa. Sub-contractor: General Bronze Corporation, New York, N. Y.

Alcoa Aluminum clear to the top color and design

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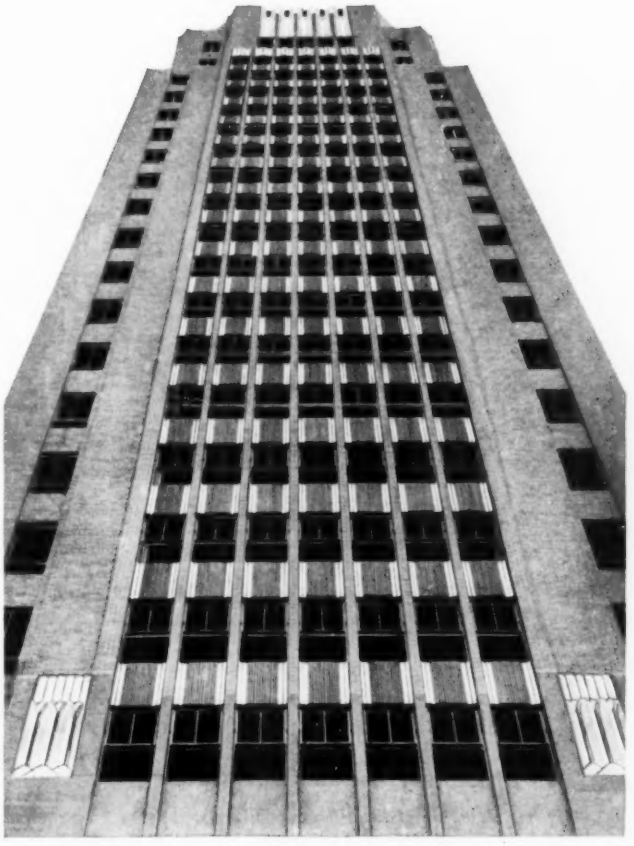

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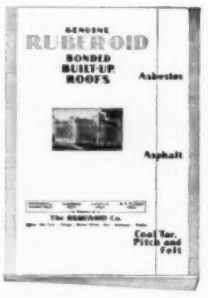

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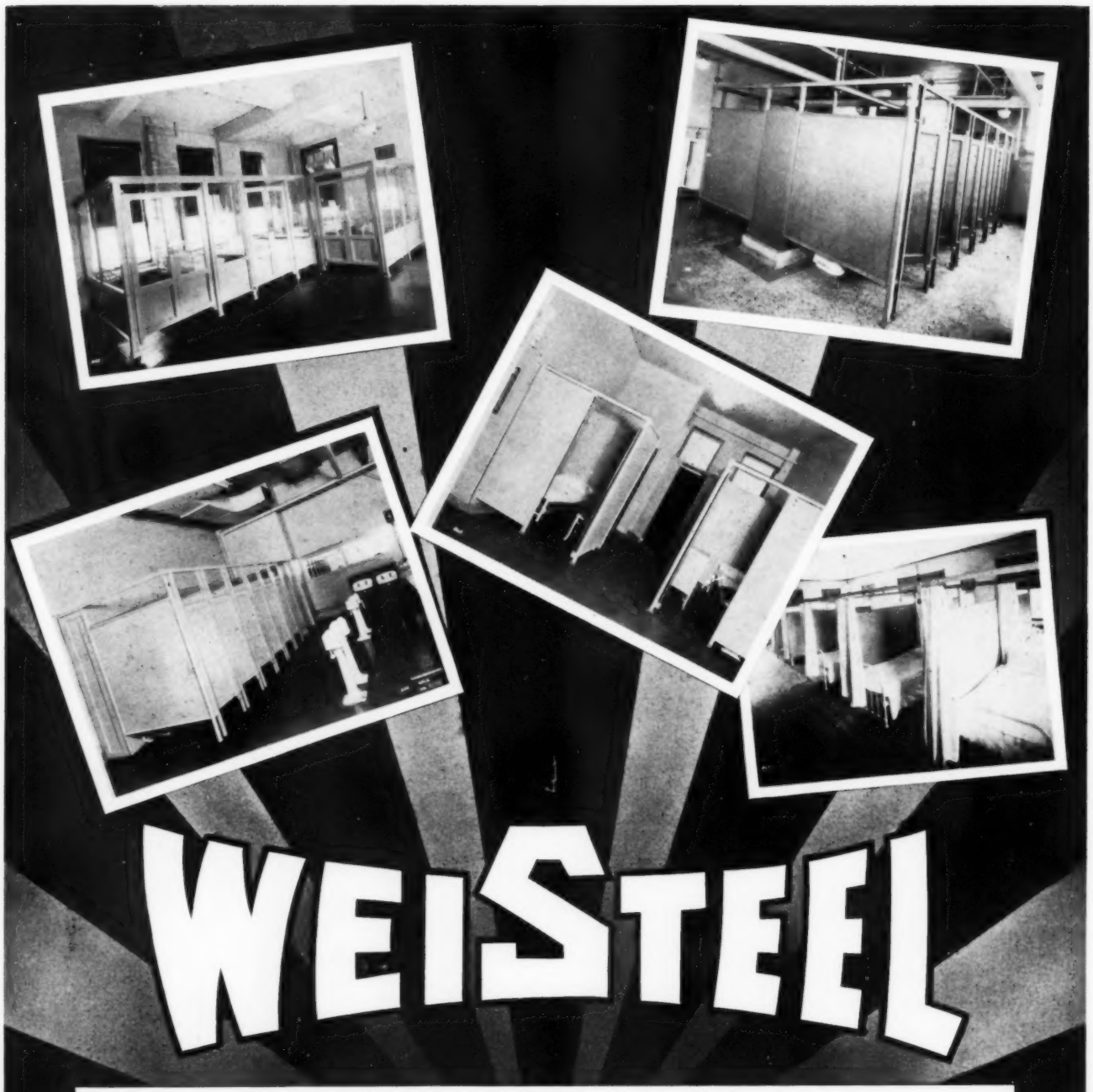

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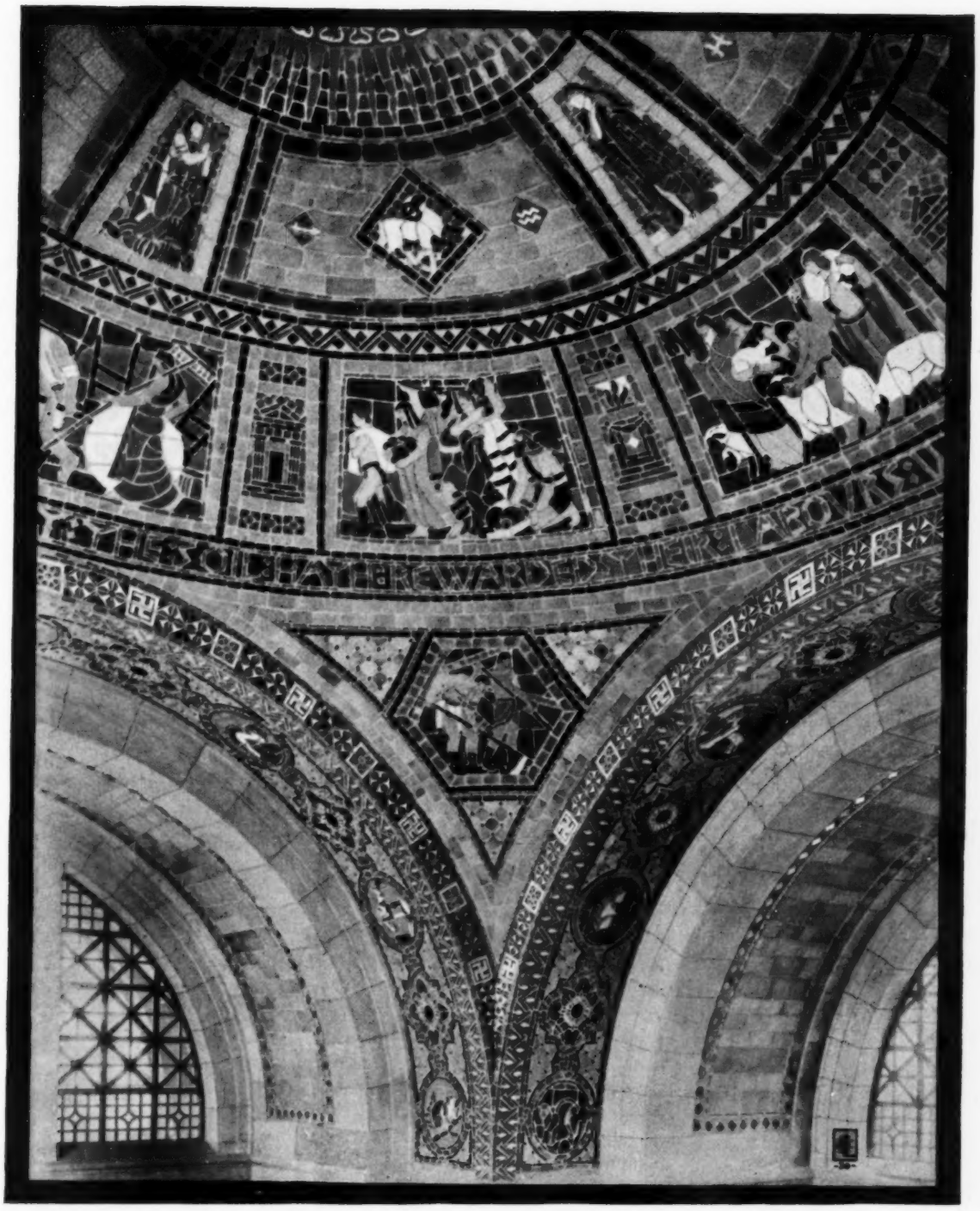

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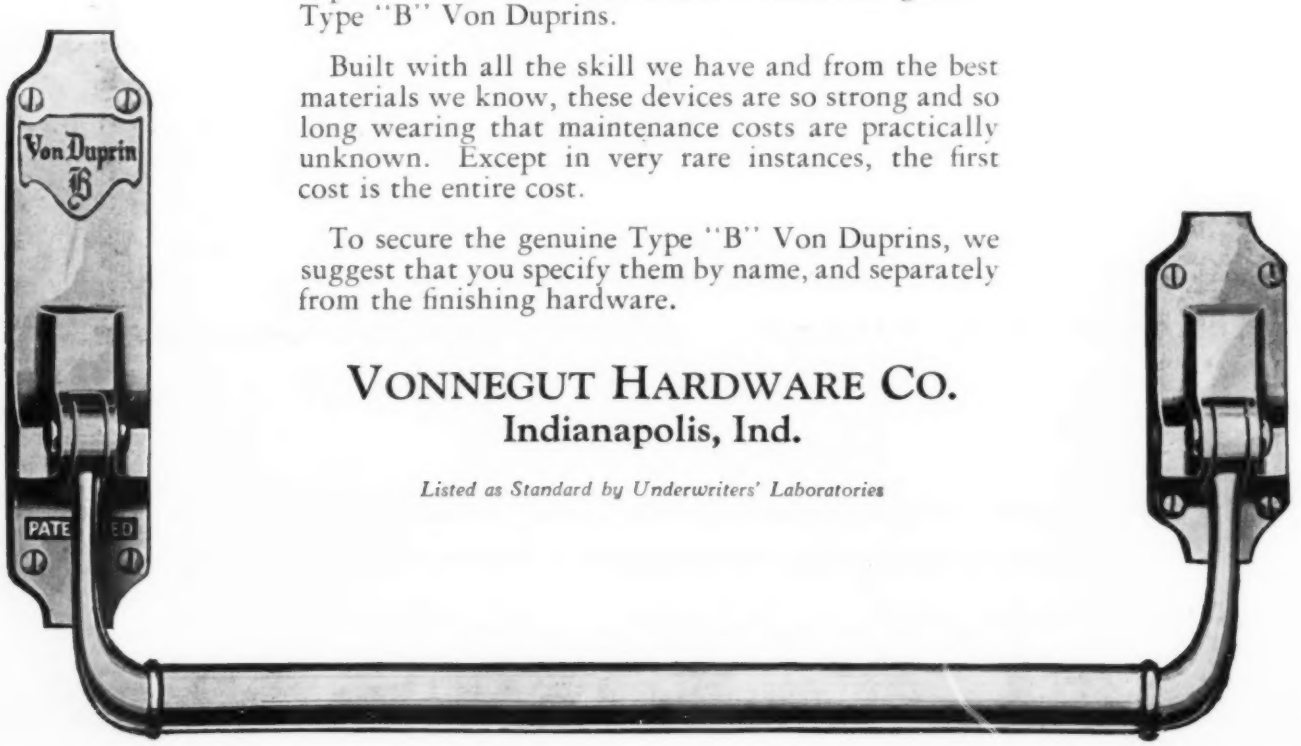
Pages C3892-C3896

Many architects believe that any building except a temporary structure deserves panic devices which are as nearly free as possible from upkeep and repair expense. It is for these men that we make the genuine Type "B" Von Duprins.

Built with all the skill we have and from the best materials we know, these devices are so strong and so long wearing that maintenance costs are practically unknown. Except in very rare instances, the first cost is the entire cost.

To secure the genuine Type "B" Von Duprins, we suggest that you specify them by name, and separately from the finishing hardware.



VONNEGUT HARDWARE CO.
Indianapolis, Ind.

Listed as Standard by Underwriters' Laboratories

Pardon my disguise!

PERHAPS A CHAMELEON has the best of reasons for trying to "look like what he ain't," but it *does* seem odd every now and again to see a building—designed in the modern style with the sweeping vertical lines and large expanses of wall that are so effective in the snowy plaster model—carried out in stone that lacks uniformity in tint and tone. How much more striking it might be if the stone were one whose warm, creamy lightness was absolutely uniform. The greatest recommendation of Victor Select and Standard Buff Limestone is its uniform, creamy tone—there are no checkerboard variations in tint and color to camouflage structural lines and offsets, kill carving detail and reduce the effectiveness of modern architectural design. Furthermore, the supply of Victor Buff Limestone is virtually unlimited—an important point where the building of today will tomorrow be surrounded by others that must necessarily be in harmony with it.

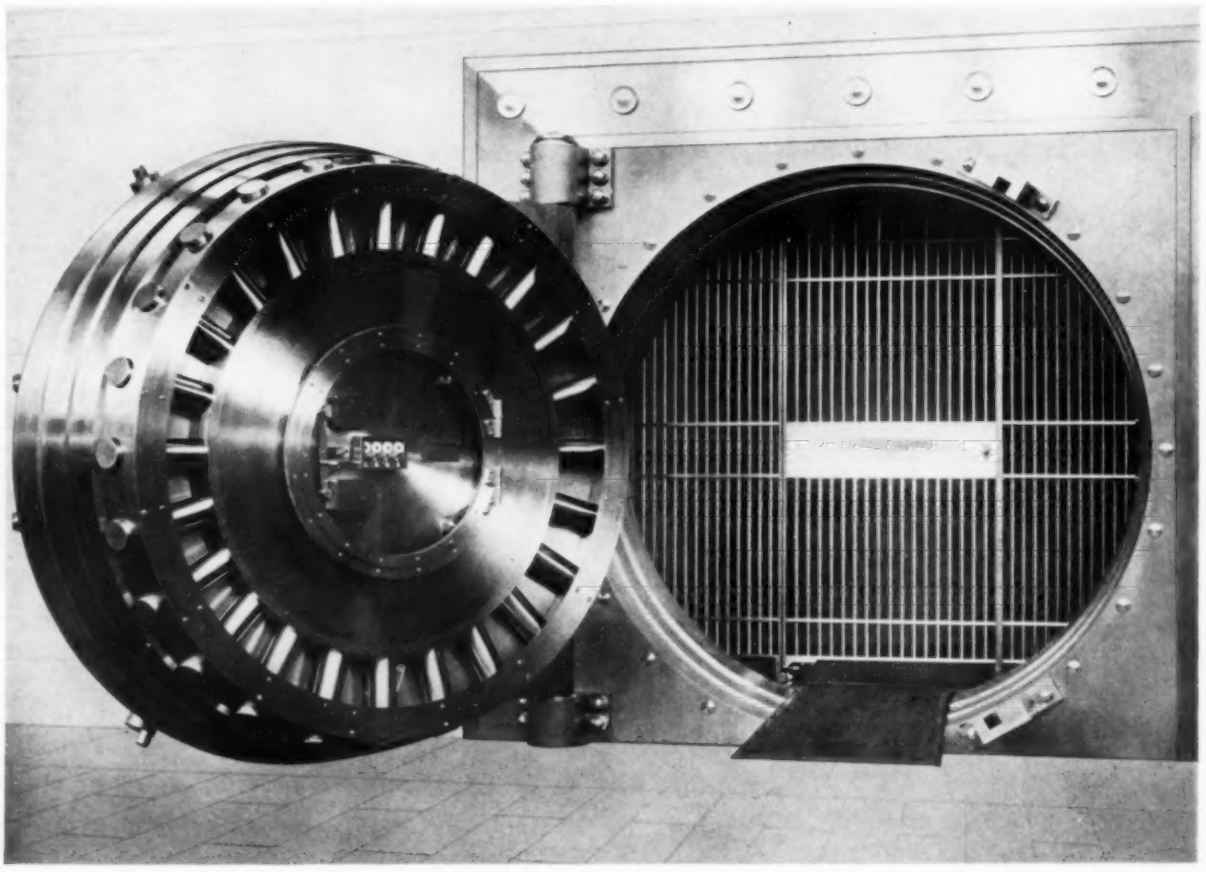
Represented in the new 4-volume Sweet's for 1931, Vol. A, page 618

VICTOR OOLITIC STONE CO.

Bloomington, Indiana

★

This vault adds Distinction to its Building



This giant door will give you an idea of the fine craftsmanship of Diebold. It weights fifty tons, yet swings on its crane hinges as easily as any ordinary door

No one would think of building a platinum setting around an imitation stone. Likewise no one would think of designing a fine building around anything but the best of vaults. The Diebold Vault, in workmanship, finish, in every way, is as perfect a vault as money can buy. Specify "Diebold Vault" in the plans for your next building. They are designed in a size and a style for every conceivable need.

Diebold Safe and Lock Company

Canton, Ohio

SEVENTY YEARS OF BANK SERVICE

Entrance—Administration Building, Lakewood Cemetery Association, Minneapolis. Ernest Kennedy, Architect.

Specify THORP DOORS

FUNCTION must always control design. Here we find simple dignity, strength wrought into the doors that form the entrance to the Administration Building of the Lakewood Cemetery. Doors and frames are of hollow bronze fashioned by Thorp. Thorp craftsmanship may be depended on always to give tangible expression to the design which the architect visions.

THORP FIREPROOF DOOR CO. *Minneapolis, Minnesota*

Comfort can go sky-high

Even in top-floor offices, all weather is good weather when roofs are insulated with cork . . . . .

TWO days after a heavy snowstorm, an airplane ride over your city will give you a true census of adequately insulated buildings. Their roofs bear witness! Where heat is escaping, the snow already has melted. Only where adequate insulation has checked this unwarranted heat loss, will snow still blanket the building.

But there are other sources of evidence. The owner of the building. His superintendent. His top-floor tenants.

Where Roof Insulation is Inadequate

The owner contributes: "That heating plant of mine just eats up fuel." His superintendent growls as he gets another call for more heat and mutters that "the furnace can't be stretched." And top-floor tenants kick about high rents for offices that are too cold in winter and too hot in summer.

All this in the building that is inadequately insulated.

Where Cork Insulates the Roof

There's a different story in the building insulated with Armstrong's Corkboard. Now heat stays where it belongs. There is no strain on the heating unit. Top-floor offices are pleasant and valuable all year 'round. Fuel dollars are saved. The owner and his superintendent are well pleased. The tenant is contented and comfortable.

And the architect knows he has done his work well. He has used Armstrong's Corkboard—the permanently reliable insulation. It resists moisture. Consequently it always retards the passage of heat —to the inside or the outside. We will be pleased to send you data that covers the subject of roof insulation completely. Just address: Armstrong Cork & Insulation Company, 901 Concord Street, Lancaster, Penna.

Sometimes a bird's-eye view is necessary to remind one of the importance of roofs—and roof insulation.—Ewing Galloway photo.

Armstrong's (A) *Product*

Armstrong's Corkboard Insulation

for the roof of every building

It is now possible for USG acoustical experts to determine by scientific methods the cause and effect of various noises, tones and pitches, as well as measuring accurately the efficiency of different methods and materials for controlling sound.

2000 Lincoln Park West Building, Chicago (McNally and Quinn, Architects). The USG System of Sound Insulation prevents the transmission of noise from one apartment to another.

Noise from pianos, radios, late parties, etc., can be prevented from bothering occupants of adjoining suites by employing the USG System of Sound Insulation.

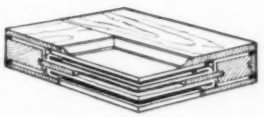
At Your Service on any phase of Architectural Acoustics

A Message to Architects
from the
United States Gypsum Company

. . . .

WITH the growing agitation for noise abatement and the increasing desire for comfortable noise levels in modern buildings of all kinds, many architects have expressed a need for reliable counsel on all phases of architectural acoustics. To meet this situation, the United States Gypsum Company has developed a complete acoustical service.

The USG service includes a competent staff of experts capable of advising architects on any problem of sound control. The creation of a great variety of scientific materials and methods to control noise, and the maintenance of skilled installation crews, enables us to predict definite results and assume full responsibility for them in every assignment which we undertake.



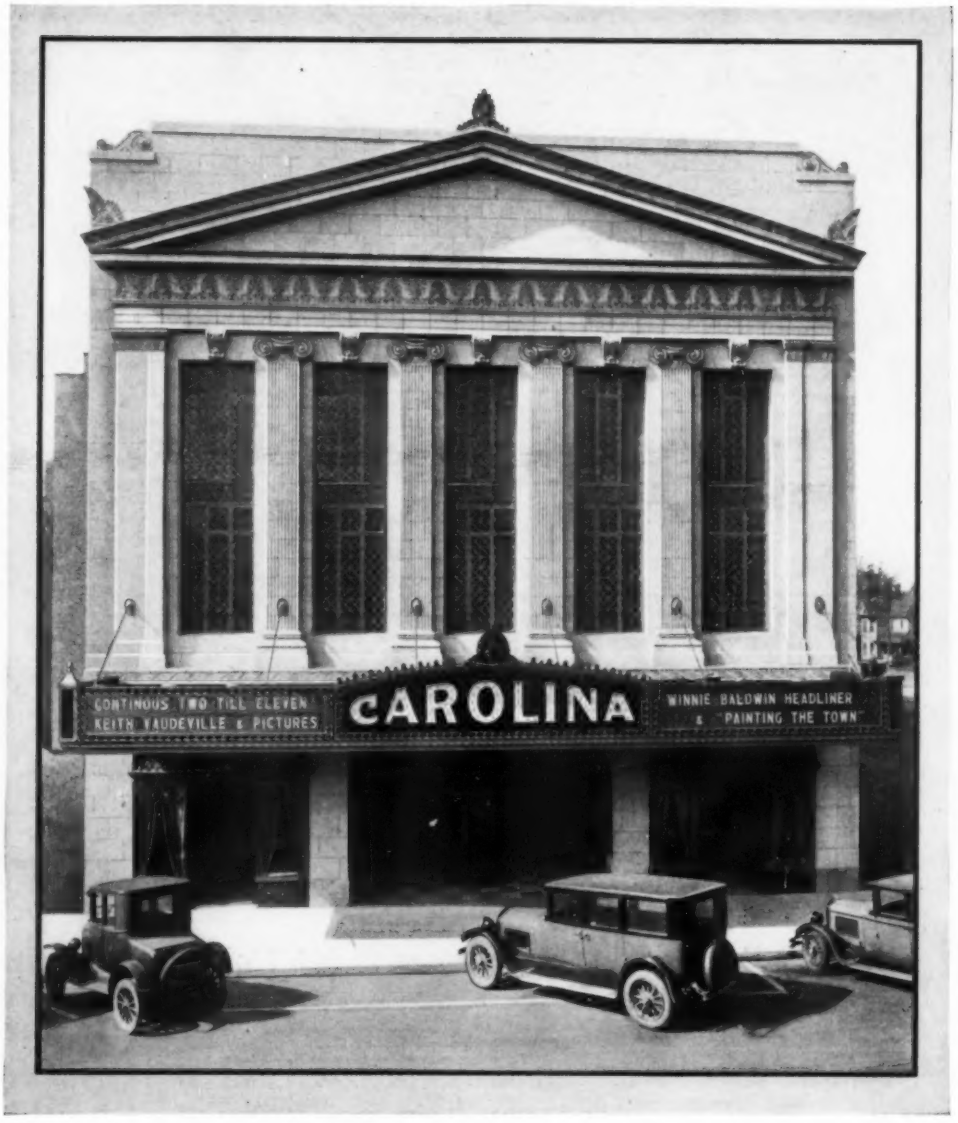
Detail of USG Sound Insulative Door. This door prevents the transmission of sound from room to room.

Where architects and their clients wish to prevent the transmission of objectionable noises from one room or floor to another, the USG System of Sound Insulation meets all requirements. It is a practical method of floor, wall, ceiling and door construction, scientifically designed to confine noise to the room of its origin. The cost is surprisingly low—usually amounting to less than 1% of the cost of the building.

Where it is desirable to reduce noise levels or to provide proper hearing conditions by means of sound absorption, Acoustone, the USG acoustical tile, has been used with great success.

Our complete facilities in architectural acoustics are at your service. For further information or for a consultation with one of our sound control experts write to us. Please address the United States Gypsum Company, Dept. 4312, 300 West Adams Street, Chicago, Illinois.

USG SYSTEM *of* SOUND INSULATION



Carolina Theatre, Greensboro, N. C. James M. Workman and J. H. de Sibour, Architects

CRITTALL CASEMENTS IN KEITH THEATRE COMBINE BEAUTY AND UTILITY

THE CAROLINA—a Keith Theatre in Greensboro, N. C.—furnishes another interesting example of the use of Crittall Windows. In that building, Universal Leaded Casements were employed most effectively—the installation contributing not only to the beauty of the facade but also providing light and ventilation for floor space which could not otherwise have been utilized.

In institutional and office buildings, too, Crittall Casements are extensively used today. A wide variety of types, sizes and designs permits a practically unlimited range of application. Three separate and complete lines are offered. Stanwin and Norman Casements are available in standardized units; Universal Casements are custom-built to the architect's own specifications. All are backed by the guarantee of the world's largest manufacturer of metal casement windows.

Crittall's complete catalog is in Sweet's—pages A-1131 to A-1200. Refer to that section for details and specifications on the complete line of Crittall Casements. Upon request, we will gladly furnish any special information required.

CRITTALL CASEMENT WINDOW COMPANY
10946 Hern Avenue · · Detroit, Michigan

STANWIN CASEMENTS · NORMAN CASEMENTS · UNIVERSAL CASEMENTS

CRITTALL CASEMENTS

FOR WATER REPELLENT MORTAR

WHEN Brixment is used, no waterproofing admixtures are necessary to produce a water-repellent mortar.

Brixment itself is made *permanently* water-resistant by a small amount of mineral oil, added during manufacture.

This makes the mortar more plastic and helps prevent efflorescence and fading of colors. . . Write for full details. Louisville Cement Company, Incorporated, Louisville, Kentucky.

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BRIXMENT

for MASONRY and STUCCO

Looking back thru the year 1930 upon the more outstanding

DAHLSTROM INSTALLATIONS

THE DAHLSTROM METALLIC DOOR COMPANY, *(Established 1904)* JAMESTOWN, NEW YORK

ELEVATOR ENTRANCES BY

DAHLSTROM

WITH OFFICES AND REPRESENTATIVES IN PRINCIPAL CITIES

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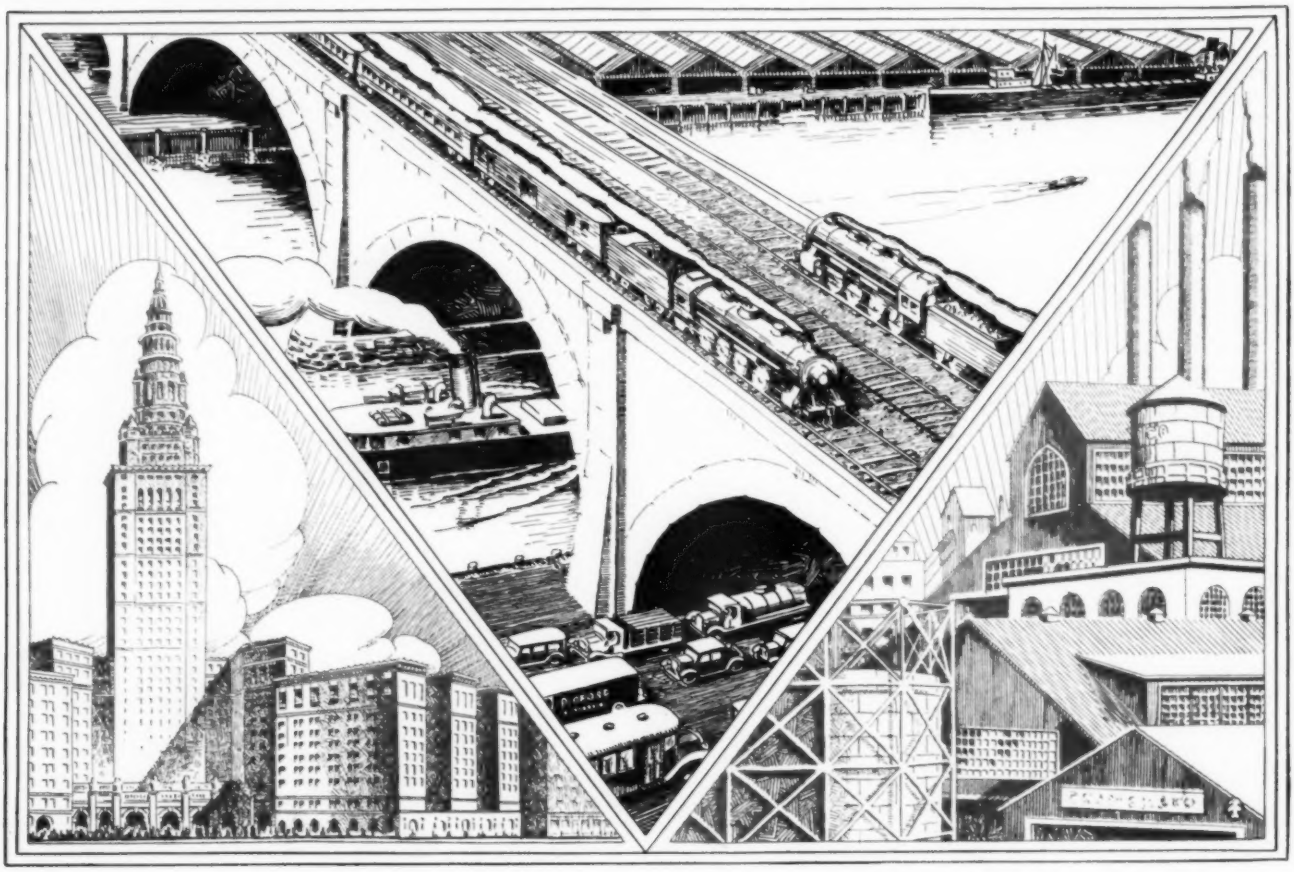

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Exacting Manufacture, that is closely controlled and is combined with skilled craftsmanship.

Successful experience extending over many years has shown that these rigid standards build lasting walls of reputation and proven worth—AMERICAN Quality. Supplied in Black and Galvanized Sheets, Automobile Sheets, Special Sheets, and Tin and Terne Plates for all known purposes. When KEYSTONE Copper Steel is used, it assures maximum endurance and resistance to rust. The excellence of this alloy has been established by time and service. Sold by leading metal merchants.

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TWO-O-ONE NORTH WELLS BUILDING, CHICAGO

Thielbar & Fugard, Chicago, Architects
Matthew Bros. Mfg. Co., Inc., Cabinet Contractor
J. B. Noelle Company, Painting Contractor

PRATT & LAMBERT *Varnish Products*

ANOTHER towering structure of 32 stories has just been added to a conspicuous group in Chicago — Two-O-One North Wells Building. Like other outstanding structures in this area, the interior has been finished with Pratt & Lambert Varnish Products, including Vitraloid Lacquer and Lyt-all, the Universal Wall Coating. Vitraloid Lacquer, a durable, instantly-dry nitrocellulose material, is invaluable where time is a factor in the finishing of large architectural projects. Lyt-all is ideal for all wall work where superior results must be secured economically. Ask the nearest P&L Architectural Service Department for information on these products.

PRATT & LAMBERT-Inc., 108 Tonawanda Street, Buffalo, N. Y. (Phone Delaware 6000); 3301 38th Avenue, Long Island City, N. Y. (Phone Stillwell 5100); 320 West 26th St., Chicago, Ill. (Phone Victory 1800). Canada: 28 Courtwright Street, Bridgeburg, Ontario.

"Save the surface and you save all" Paint & Varnish

TRADE MARK P&L REG. U.S. PAT. OFF.

Advanced Design in Quality Steel Windows

Truscon offers in its steel windows some of the finest examples of modern steelcraft. Their distinctive superiority is evident in design, materials, workmanship and equipment. So efficiently are they manufactured that their unusual quality is available at moderate cost.

TRUSCON DOUBLE-HUNG Steel Windows, Model No. 28

(Shown Below)

Galvanized steel used throughout. Unit frames solidly welded at corners. Special, solid cold rolled sections for sash rails. Deep rigid sill sections. Spring bronze weatherstripping. High quality hardware. Convenient application of screens. Trim, clean cut lines. Fire protection, permanence and easy operation. Furnished in standard units, or in combinations to meet all practical requirements.

TRUSCON heavy type STEEL CASEMENTS

(Shown Above)

Built of heavy sections of copper bearing steel with drips of KA-2 Enduro rustless steel. Flat double contact throughout of not less than ⅜-inch. Solid bronze hardware of improved design. Furnished to open out or in, in complete units with single or double sash, transoms and hopper vents. Glazing may be either on outside with putty or on inside with putty or special hot rolled glazing beads.

DONOVAN AWNING TYPE Steel Windows, Model No. 29

(Shown Above)

Extremely simple operation. Movement of lower sash controls upper sash, opening all sash or only lower or upper sash. No window poles required. Shades on open sash act as awnings. Ample ventilation without draughts and diffused daylight without sun glare. Constructed of heavy channel sections welded at all joints. Flat double contact weathering. Units of two or three sashes furnished in various standard sizes.

Catalogs and full information on Truscon Steel Windows sent on request

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TRUSCON

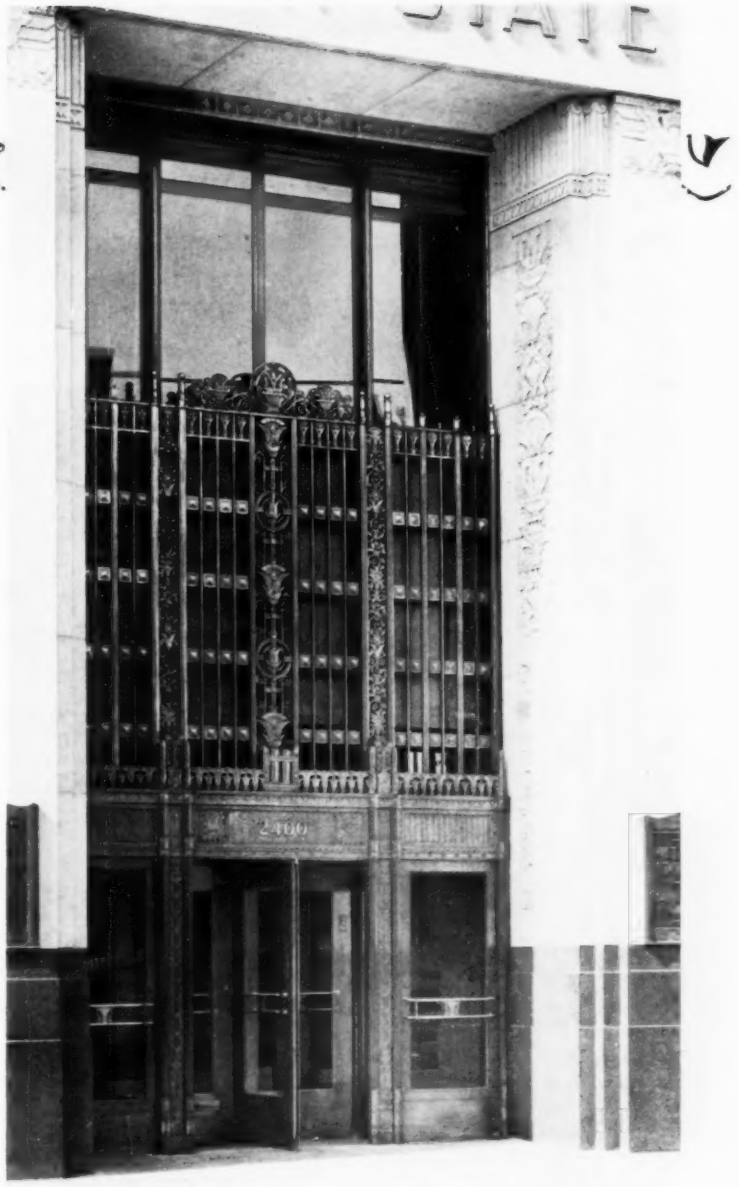
ORNA-METAL

Crafted by MICHAELS

FOR WEST TOWN STATE BANK, CHICAGO

WHERE metals and ideals are affinities . . . melted in the same flaming pot . . . poured in the same mold are ideas and ideals that make orna-metal work crafted by Michaels a supreme attainment. Many of the world's most prominent architects find the expression of their art in metal when crafted by Michaels.

For example, the above beautiful grille and header in the West Town State Bank, Chicago. Here is mute evidence of Michael's orna-metal,—different thru its perfect interpretation of the architect's ideal.



Doors, header and grille of Benedict Nickle in the West Town State Bank, Chicago. Designed by Architect Mundie & Jensen. McLennan Construction Company, Chicago, contractors. Crafted by Michaels Art Bronze Co., Covington, Ky.

Michael's welded doors, extruded window frames and store fronts are architectural and engineering achievements! To help you with these details we have prepared ready for blue-printing, complete sets of tracings. Write for your set in an angular tabbed A.I.A. folder.

THE MICHAELS ART BRONZE CO.

Orna-Metal Craftsmen Since 1870

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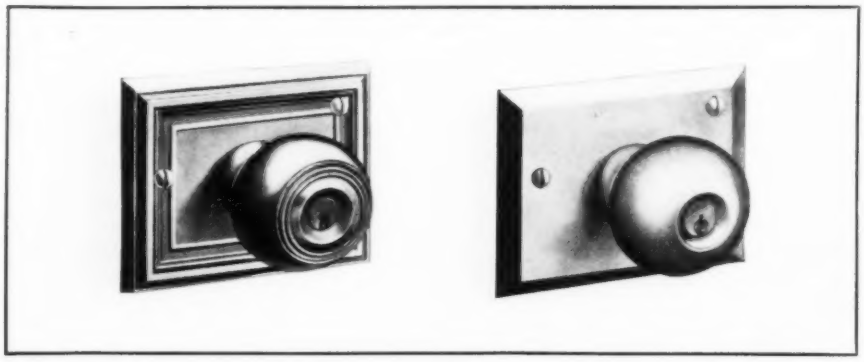
EXCELLENCE OF CONSTRUCTION DEMANDS THE BEST EQUIPMENT

Sargent Hardware adds to the beauty and service of this recently completed Cleveland Terminal Group, consisting of hotel, office building, and railroad terminal. Graham, Anderson, Probst & White, architects. The Sargent Union Locks shown indicate the up-to-date design and the high quality of the complete Sargent equipment.



SARGENT

LOCKS AND HARDWARE

SARGENT HARDWARE contributes to the beauty and usefulness of each one of the buildings that make up the great Cleveland Terminal Group — office building, hotel, and railroad terminal. So also Sargent Hardware will add to the complete satisfaction of your own home. This fine quality hardware is a usual specification when excellence of equipment must finish off excellence of construction.

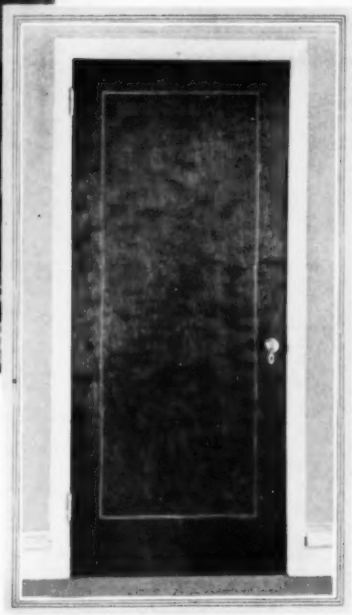
Sargent Hardware covers the entire field of building — hotel, apartment, hospital, public and educational buildings and residences of every size. Designs range from classic, authentic reproductions of the various period patterns to the extreme simplicity of the ultra-modern.

Sargent Hardware, of solid brass or bronze, is extremely durable. Of the finest materials and the most precise workmanship, the operation of each item is lastingly easy and smooth. Now, as for generations, the name SARGENT, on any hardware item, stands for finest quality merchandise. Sargent & Company, New Haven, Connecticut. In New York City — Builders' Hardware Division and Showroom, 295 Madison Avenue; Warehouse, 94 Centre Street. In Chicago—150 North Wacker Drive (at Randolph).

GREATLY HIGHER VALUE FOR GREATER LESS COST

Chateau Crillon Apartment Building
Philadelphia . . . . . .
Horace Trumbauer . . . . . *Architect*
And a View of the Roddis Flush Doors
Installed . . . . . .

After all, Roddis Flush Doors when finished cost less than ordinary doors made ready for hanging. Roddis Doors when stained, filled and shellacked at our factory before shipping are protected and preserved in transit against moisture, warping, raising grain, etc. The doors arrive at the job ready to hang, with only the final coat of finish to apply. The sanding and finishing expense is saved; and in addition a far superior door is obtained because of Roddis completely solid construction and permanently enduring beauty and finish. Therefore, where Roddis quoted price might be a little higher, the greatly higher value and economy represented make Roddis price actually lowest.



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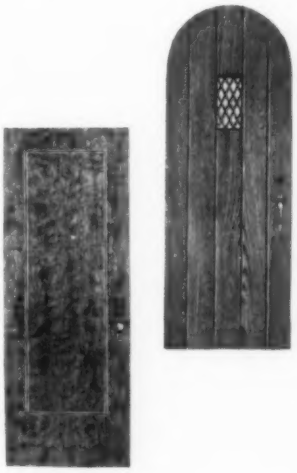
— for residences especially

Before you next decide upon doors write for and read the interesting Roddis Catalog: of exceptionally attractive stock doors, for apartment buildings and residences particularly. Where you require a special inlay or figure design to particularly lend with the interior trim, Roddis Department of Design is at your service: to originate or to follow idea furnished. Roddis Flush Doors, of standard styles or custom made special designs are universally preferred: for most enduring service and beauty and real economy value. Write Roddis now.



Ph. Lindsley Small, Cleveland, Ohio . . Architect

RODDIS LUMBER & VENEER CO.
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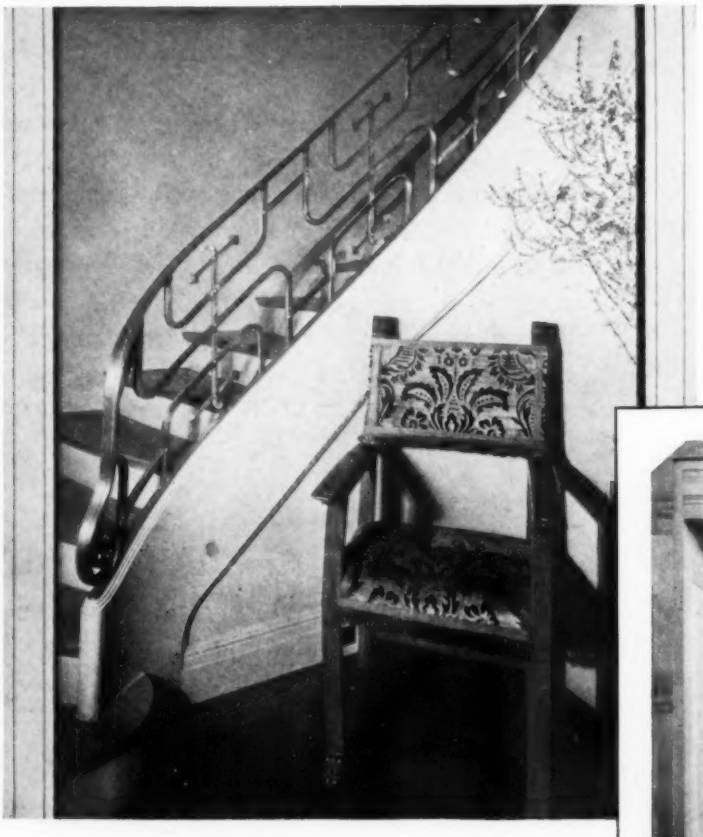
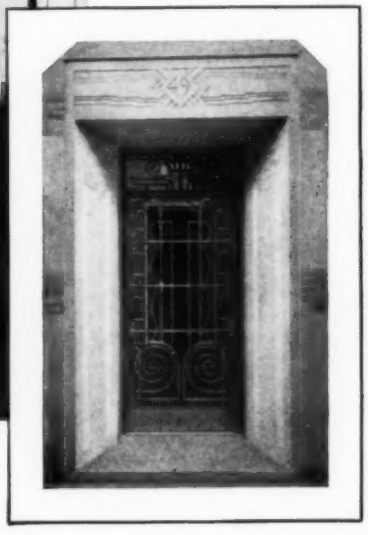


(At left) *Stair rail of forged Monel Metal, manufactured for a New York residence by RENNER & MARAS, INC., Long Island City, N. Y. HARRY ALLEN JACOBS, Architect.* (Below) *Forged Monel Metal door installed in same residence.*



Enduring Monel Metal...

for distinctive effects in modern design

For modern metal work Monel Metal enables the architect or designer to achieve original effects with enduring charm and distinction.

The stair railing illustrated is typical of the many unusual treatments available with Monel Metal. In this case, it is noteworthy that the design is structural and not achieved through applied ornamentation.

Monel Metal is just as well-suited to outside as to interior metal work, because it is immune to rust and resistant to the attacks of corrosion. It can be kept clean with minimum cleaning effort. It has no coating to chip or wear off, for it is solid throughout—like sterling. Its rich, silvery beauty will endure indefinitely against the ravages of wear and weather.

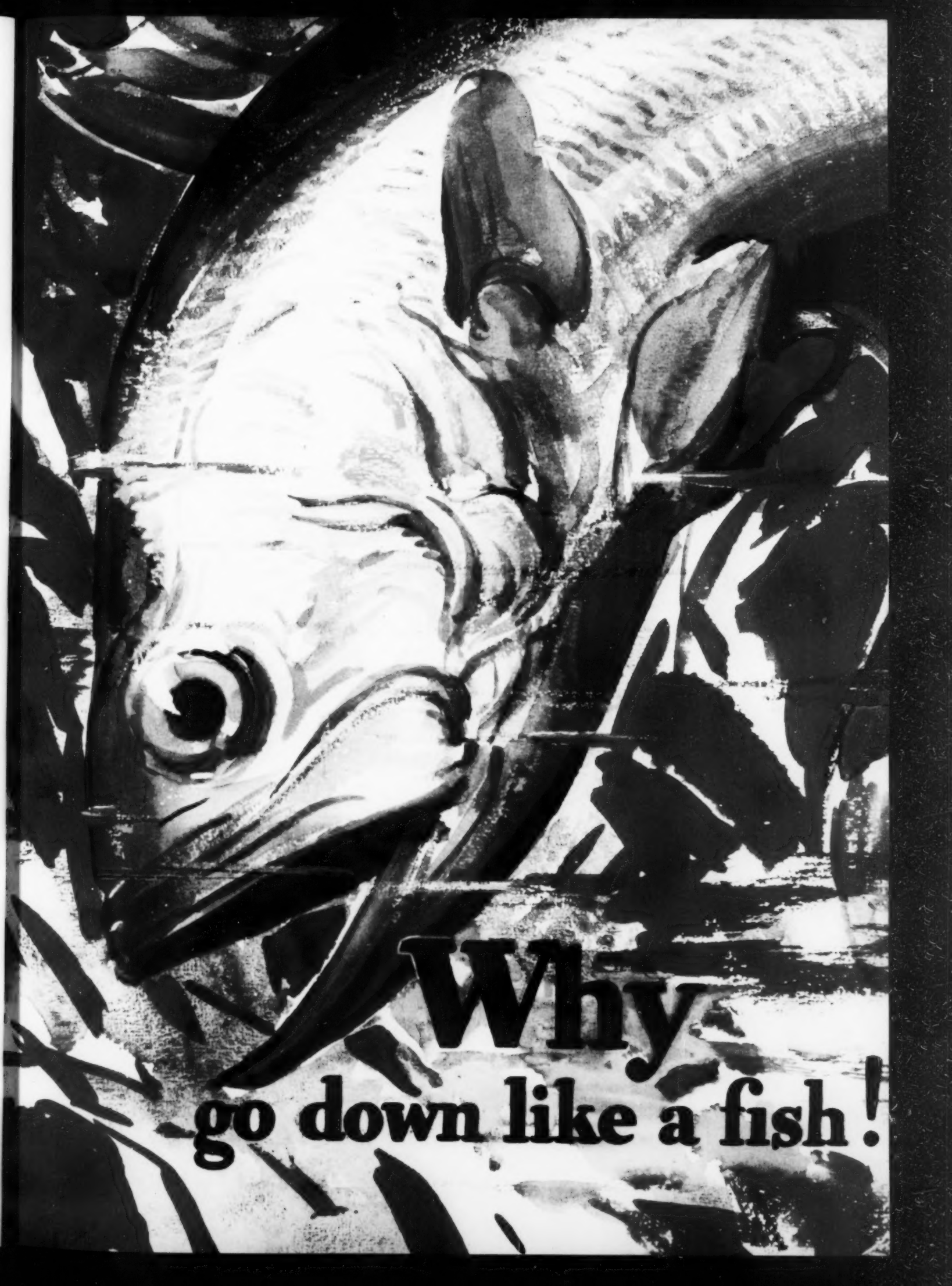
Monel Metal is available from stock in all standard shapes and forms and a wide range of finishes. Write for additional information on structural and ornamental uses of this modern material.

INCO MONEL METAL

MONEL METAL

Monel Metal is a registered trade mark applied to a scientifically controlled nickel-copper alloy of high nickel content. Monel Metal is mined, smelted, refined, rolled and marketed solely by International Nickel.

THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL STREET, NEW YORK, N. Y.


Why
go down like a fish!

A Jennings Sewage Pump *has only the suction pipe* submerged

You can inspect or clean a Jennings *right out on the floor*

CONVENIENCE is the outstanding feature of a Jennings. There is nothing awkward about getting at this sewage pump. The entire assembly is installed on the floor, outside the pit. Nothing is submerged except the suction pipe.

With every working part so accessible, easy work is made of inspection and cleaning. Opening up the pump and even removing the impeller takes only a few minutes. Neither pit cover, piping nor shaft alignment need be disturbed.

Jennings Suction Sewage Pumps are furnished in capacities and heads to meet all the usual requirements. All sizes are equipped with non-clog impellers. No screens are required.

Write for Bulletins 113 and 124.

NASH ENGINEERING COMPANY
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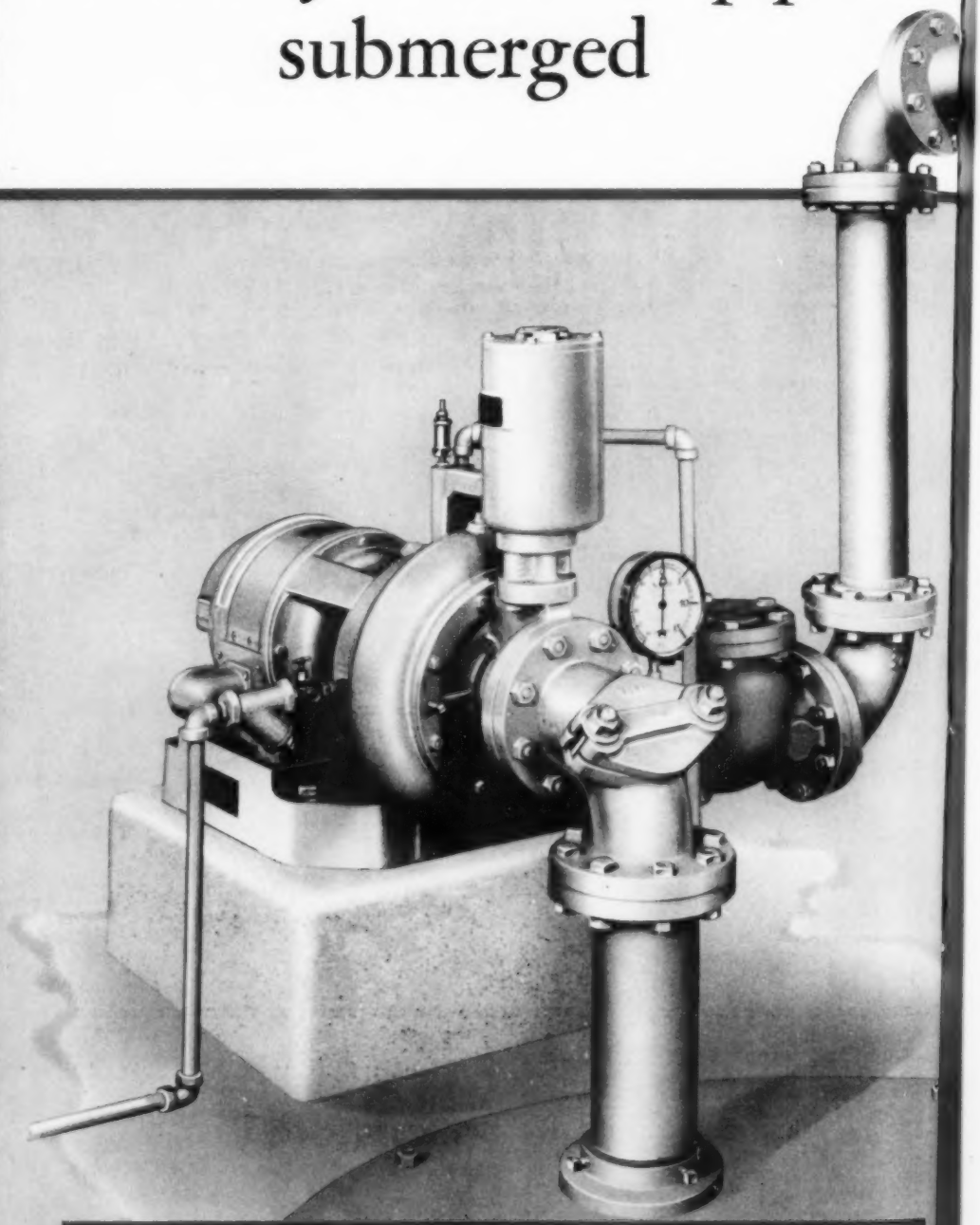
Jennings
SUCTION
SEWAGE
Pumps

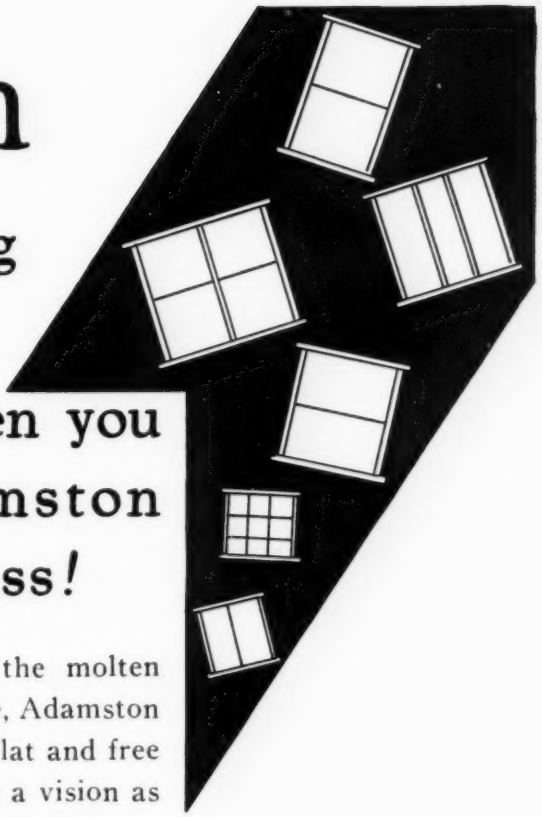


Note these 10 *features of Jennings Design*

1. Motor is commercial, ball-bearing type selected for dependability, always available from stock.
2. The only two moving parts are mounted on a single heavy shaft requiring but one stuffing box, eliminating flexible coupling.
3. A rugged supporting bracket, integral with motor end shield, makes pump and driving motor a single compact assembly in perfect alignment.
4. The non-clog impeller is accurately balanced, liberally proportioned, readily reached.
5. There are only two bearings to lubricate.
6. Suction elbow is fitted with hand hole plate to permit cleaning suction pipe and impeller without dismantling pump.
7. Priming unit is a simple, sturdy Nash Hytor.
8. Iron catch basin has gas tight cover.
9. Controlling float switch is totally enclosed and oil immersed.
10. Ball float has adjustable stop.

Clear Vision

for the Eyes of your Building



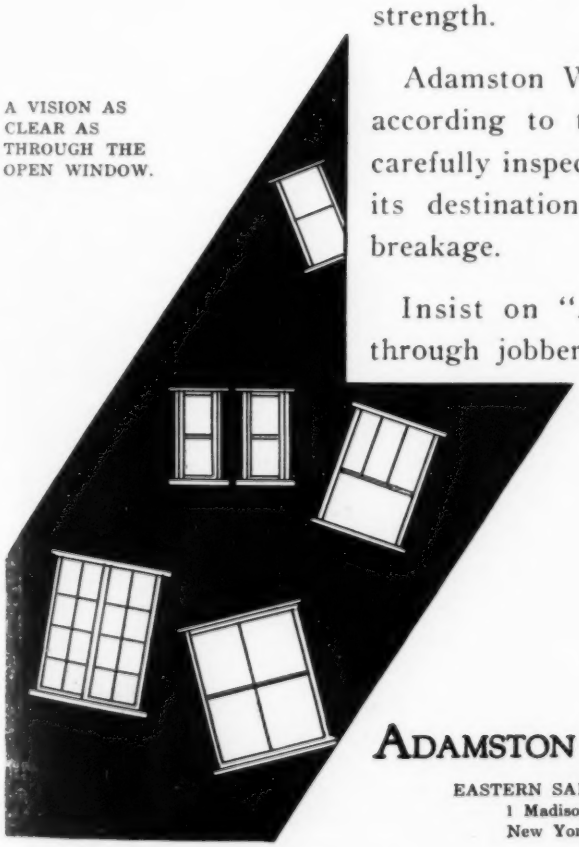
is assured when you specify Adamston Window Glass!

Vertically Drawn from the molten "Metal" to the finished state, Adamston Window Glass is perfectly flat and free from distortion—permitting a vision as clear as through the open window.

In addition to its clearness it has a beautiful lustre, either side may be glazed out, and it is of great tensile strength.

Adamston Window Glass is graded according to the highest standards, carefully inspected and packed to reach its destination with a minimum of breakage.

Insist on "Adamston"—obtainable through jobbers in all principal cities.



A VISION AS CLEAR AS THROUGH THE OPEN WINDOW.

Winter Windows

Insulating homes against the dangerous drafts of winter with storm sash is an excellent investment, not only as a safe guard to the health of the family, but in the matter of fuel. Here again Adamston Window Glass may be specified with a feeling of security.

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ADAMSTON FLAT GLASS CO.
CLARKSBURG, W. VA.

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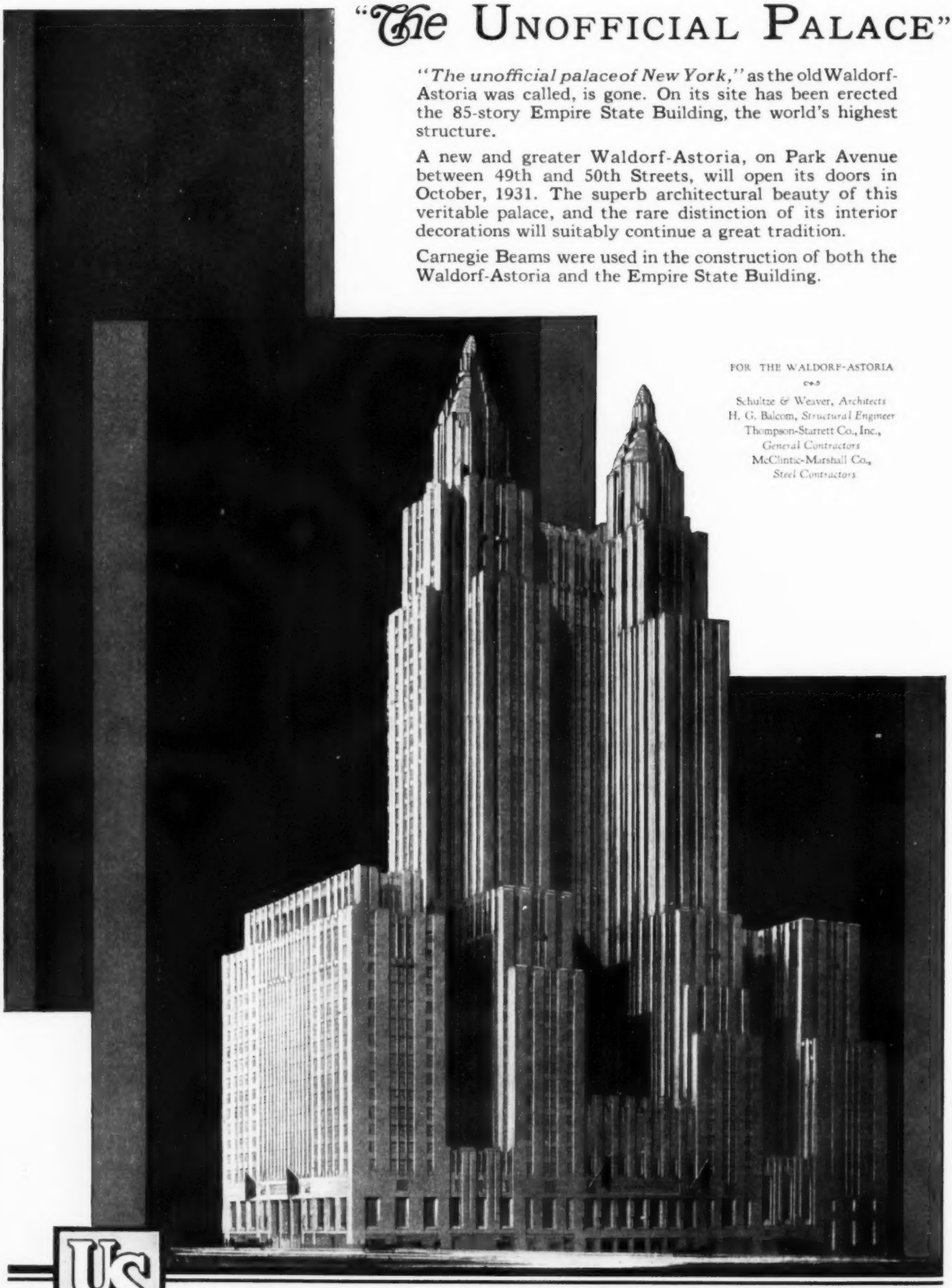
"The Unofficial Palace"

"The unofficial palace of New York," as the old Waldorf-Astoria was called, is gone. On its site has been erected the 85-story Empire State Building, the world's highest structure.

A new and greater Waldorf-Astoria, on Park Avenue between 49th and 50th Streets, will open its doors in October, 1931. The superb architectural beauty of this veritable palace, and the rare distinction of its interior decorations will suitably continue a great tradition.

Carnegie Beams were used in the construction of both the Waldorf-Astoria and the Empire State Building.



FOR THE WALDORF-ASTORIA

Schultze & Weaver, *Architects*
H. G. Balcom, *Structural Engineer*
Thompson-Starrett Co., Inc., *General Contractors*
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US STEEL

CARNEGIE STEEL COMPANY - PITTSBURGH

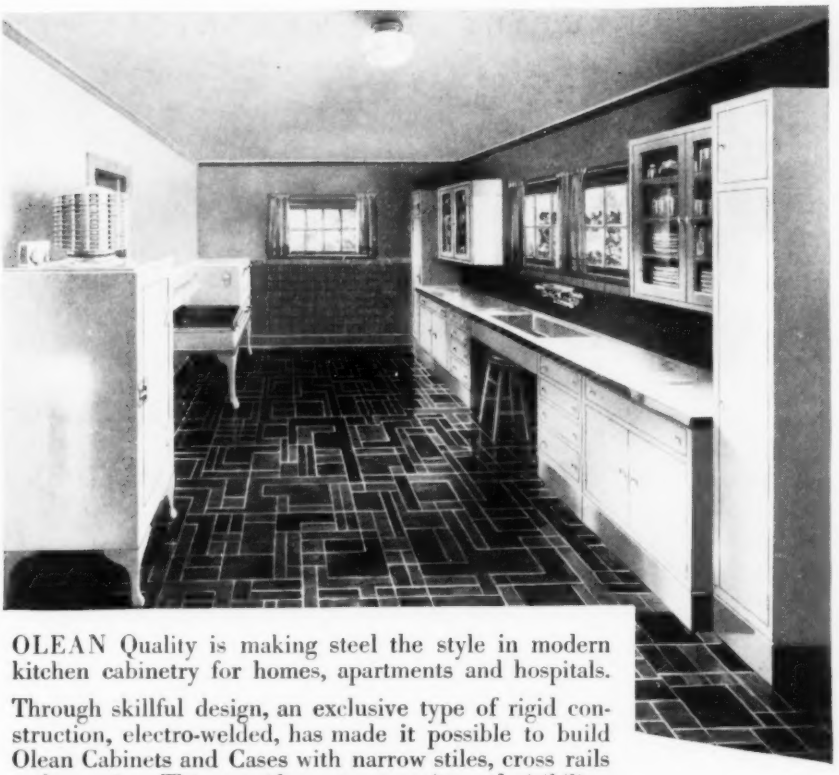
Subsidiary of United States Steel Corporation

103

Steel is Style

in Modern Kitchen Cabinetry

New Cabinetry Features Innovations in Construction



OLEAN Quality is making steel the style in modern kitchen cabinetry for homes, apartments and hospitals.

Through skillful design, an exclusive type of rigid construction, electro-welded, has made it possible to build Olean Cabinets and Cases with narrow stiles, cross rails and margins. This provides extra capacity and visibility.

Strong, durable and distinctive hardware is used throughout—New semi-concealed hinges—Adjustable shelf supports—Non-sagging drawer channels with automatic stops—Special drawer locks—All exposed edges are carefully rounded—Counters can be furnished in Monel Metal—Steel covering—Laminated maple—or Linoleum.

Olean finishes which will not mar, chip or scratch are applied by scientific electric baking methods, and in any color to harmonize with any motif of interior decoration.

A new factory with modern and ample facilities assures the prompt delivery on all contracts no matter what size.

All Olean installations are guaranteed to comply with architects' specifications. Write today for detailed layouts, specifications and illustrations of Olean Cabinetry.

OLEAN METAL CABINET WORKS, INC., OLEAN, N.Y.

OLEAN

Metal Cabinets

OLEAN METAL CABINET WORKS, INC., Olean, N. Y.

Please send specifications and details of Olean Cabinets of Steel.

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Address _____

City _____

STRIKING A MODERN NOTE IN LIGHTING

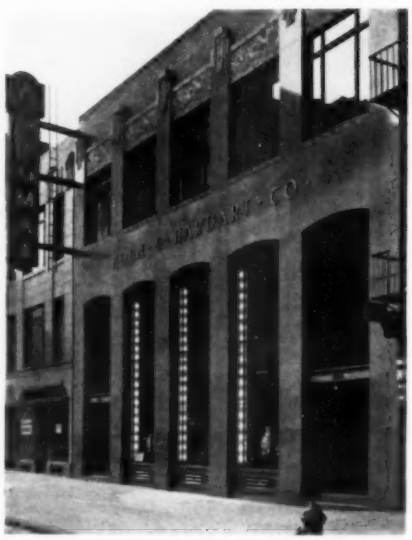
with wiring adapted to restaurant needs

by FREDERICK PUTNAM PLATT—A. I. A.
of F. P. Platt & Bro., Architects, New York, N. Y.

In the Horn & Hardart Company restaurant at 1165 Sixth Avenue, New York, light enhances the inviting atmosphere of the restaurant and provides appetizing display for food.

Uncontrollable factors necessitated the development of an unusual type of exterior illumination for this building and the decorative scheme of the interior called for a lighting plan that would take full advantage of the colors and materials used.

In such a situation, where specific questions of lighting practice are raised, proper co-operation between the architect and the lighting and wiring section of the local electric service company can be most valuable. Information about changing styles in lighting and about the use of light for both decorative and merchandising purposes helps materially in reaching a happy solution of the problems.



Passers-by are attracted by the unusual exterior illumination—lighted panels installed at the sides of the window jambs.

For the exterior illumination in this case, lighted panels are used at the sides of the window jambs. These give a pleasing effect, both day and night, while they also bathe the interior with a soft glow of light which enriches the decorative features.

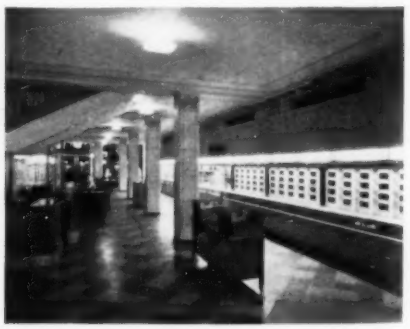
Modernistic ceiling and side wall fixtures make the restaurant interior inviting. A continuous hood-light over the cafeteria and automat counters is used in the merchandising of food.

The total connected load in this restaurant is 63 K.W. for lighting and 50 H.P. for power. Every care has been taken in the wiring to provide for possible future needs of the kind that are constantly developing through the increasing use of electricity.

Attractive pendant type fixtures provide general illumination over the mezzanine well.

Hood light illumination is used over the counters with a concealed lamp in each food compartment.

In the smaller bays a modernistic, box-type carved glass fixture is used.



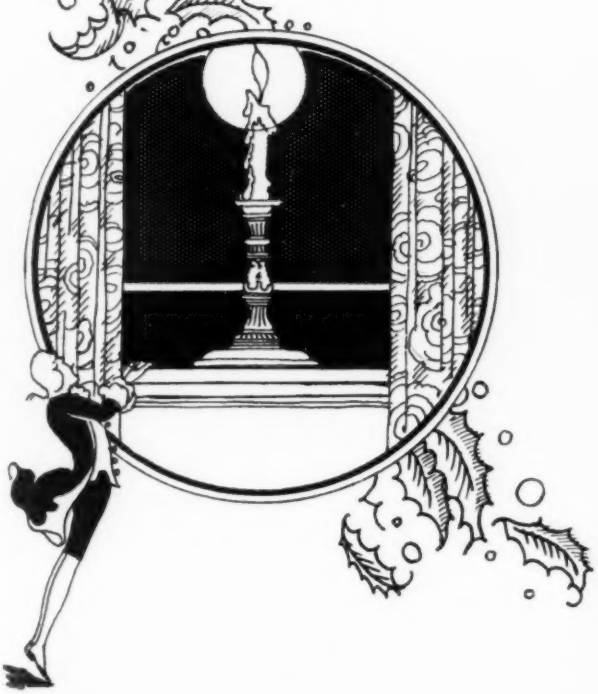
For information about trends in lighting standards, and about adequate wiring, call on the Wiring Bureau of your local electric service company, or write direct.

NATIONAL ELECTRIC LIGHT ASSOCIATION, 420 LEXINGTON AVENUE, NEW YORK, N. Y.

Rolscreens

TRADE MARK

Greetings



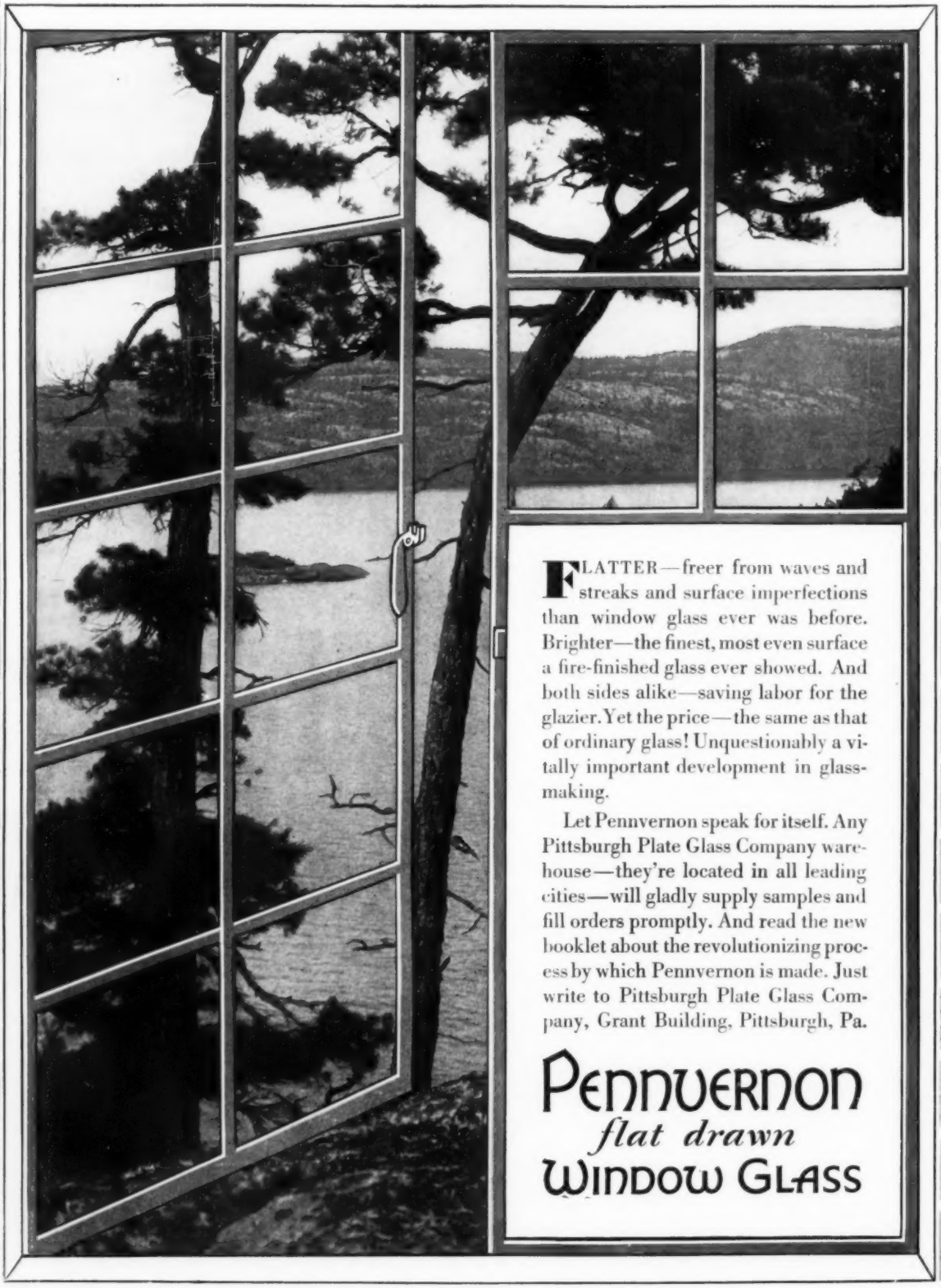
DECEMBER ends the year and with it comes the greatest inventory of all—that of counting our friends.

Friendships in business often pass without expressions of appreciation. The enthusiastic endorsement and support given Rolscreens by architects during the past year have been vital factors in making the volume of Rolscreen sales far greater than had been anticipated.

To you, the architect who reads this page, is sent the season's greetings and a sincere "Thank you" for your cooperative spirit which the Rolscreen Company has enjoyed in 1930.

Rolscreen Company
450 Main Street
Pella :: :: :: Iowa

FLATTER, BRIGHTER, CLEARER —YET *NOT* HIGHER PRICED



FLATTER—freer from waves and streaks and surface imperfections than window glass ever was before. Brighter—the finest, most even surface a fire-finished glass ever showed. And both sides alike—saving labor for the glazier. Yet the price—the same as that of ordinary glass! Unquestionably a vitally important development in glass-making.

Let Pennvernon speak for itself. Any Pittsburgh Plate Glass Company warehouse—they're located in all leading cities—will gladly supply samples and fill orders promptly. And read the new booklet about the revolutionizing process by which Pennvernon is made. Just write to Pittsburgh Plate Glass Company, Grant Building, Pittsburgh, Pa.

PENNVERNON
flat drawn
WINDOW GLASS

IN THIS PITTSBURGH HOSPITAL

Allegheny General Hospital
Pittsburgh, Pa.

York & Sawyer,
Architects

Geo. H. Soffel Company,
Plumbing Contractor

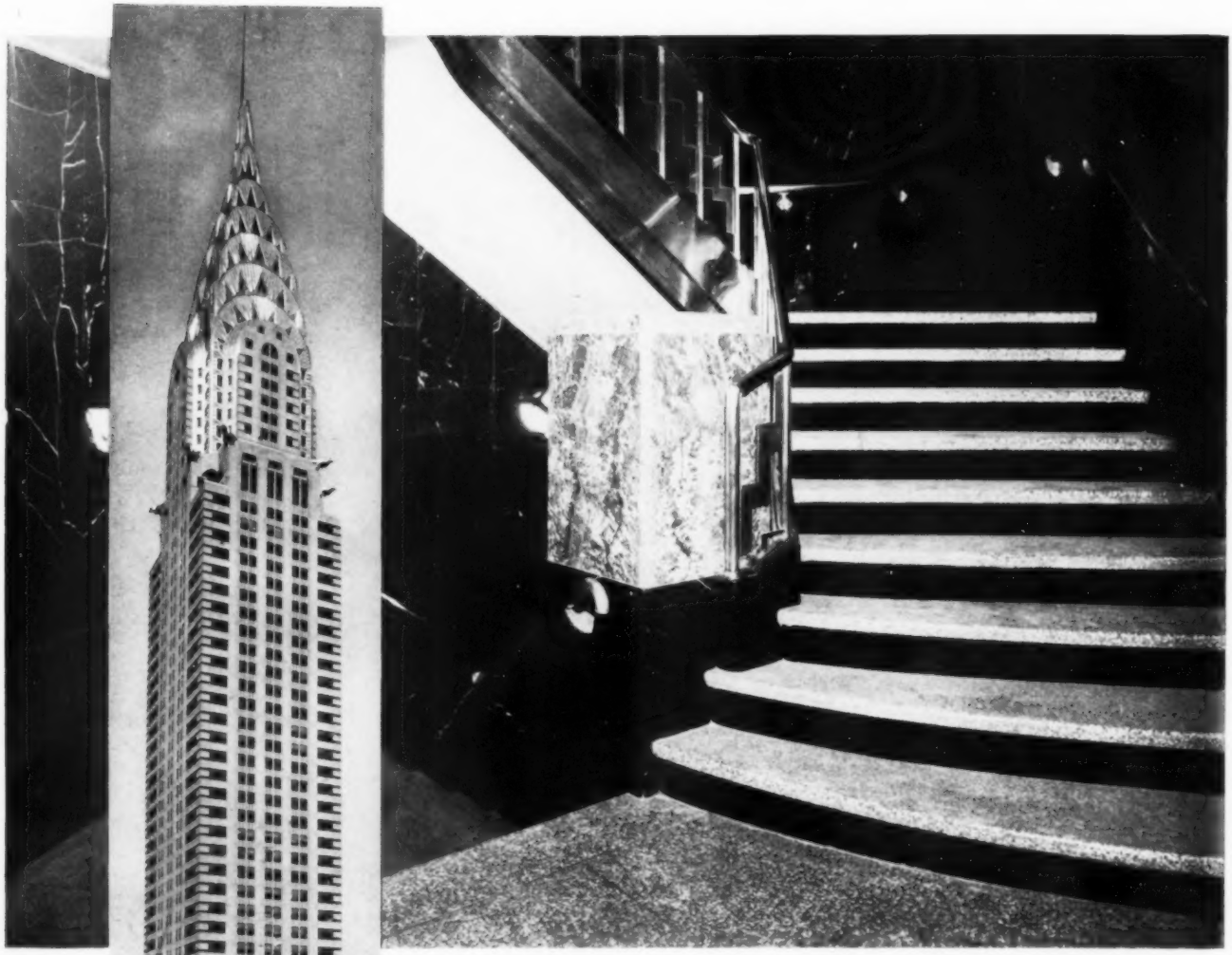
See Sweets
(14 Pages)

York & Sawyer, New York architects, fully realize the value of assured sanitation and freedom from servicing troubles in the drinking water fixtures they select. So, in specifying the drinking fountains for this beautiful, modernly appointed hospital, Halsey Taylor was the choice! The Halsey W. Taylor Co., Warren, Ohio.

This is No. 631, the type specified for the above building, with automatic stream control (uniform height of drinking stream regardless of pressure changes) and patented two-stream projector (illustrated) which makes it impractical for lips to touch source of supply.

HALSEY TAYLOR *Drinking Fountains*

THE SPECIFICATION FOR SANITATION



Modernistic Design for Beauty Modern Materials for Safety

THIS stairway is typical of the new Chrysler Building—thoroughly modern in design from the viewpoints of both safety and beauty. Alundum Aggregate Treads assure permanently non-slip walking surfaces on the main stairways that lead from the street floor to the next floors above and below.

Another form of Norton Floors—Alundum Terrazzo—has been used under the revolving doors of the entrances, for elevator mats and corridor ramps.

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Alundum Tiles, Treads & Aggregates

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The Famous

TIGER FINISH

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Lorain Street Branch of the GUARDIAN TRUST COMPANY, Cleveland, O., Rowland Johnson, *Archt.*, Geo. L. Craig, Inc., *Contrs.* The facade is Georgia Mezzotint Marble with Georgia Creole Marble base and trim. The white metal used in the large openings of the bank proper, contrasts beautifully with the bold veining in the Creole Marble trim.

THE GEORGIA MARBLE COMPANY · TATE · GEORGIA

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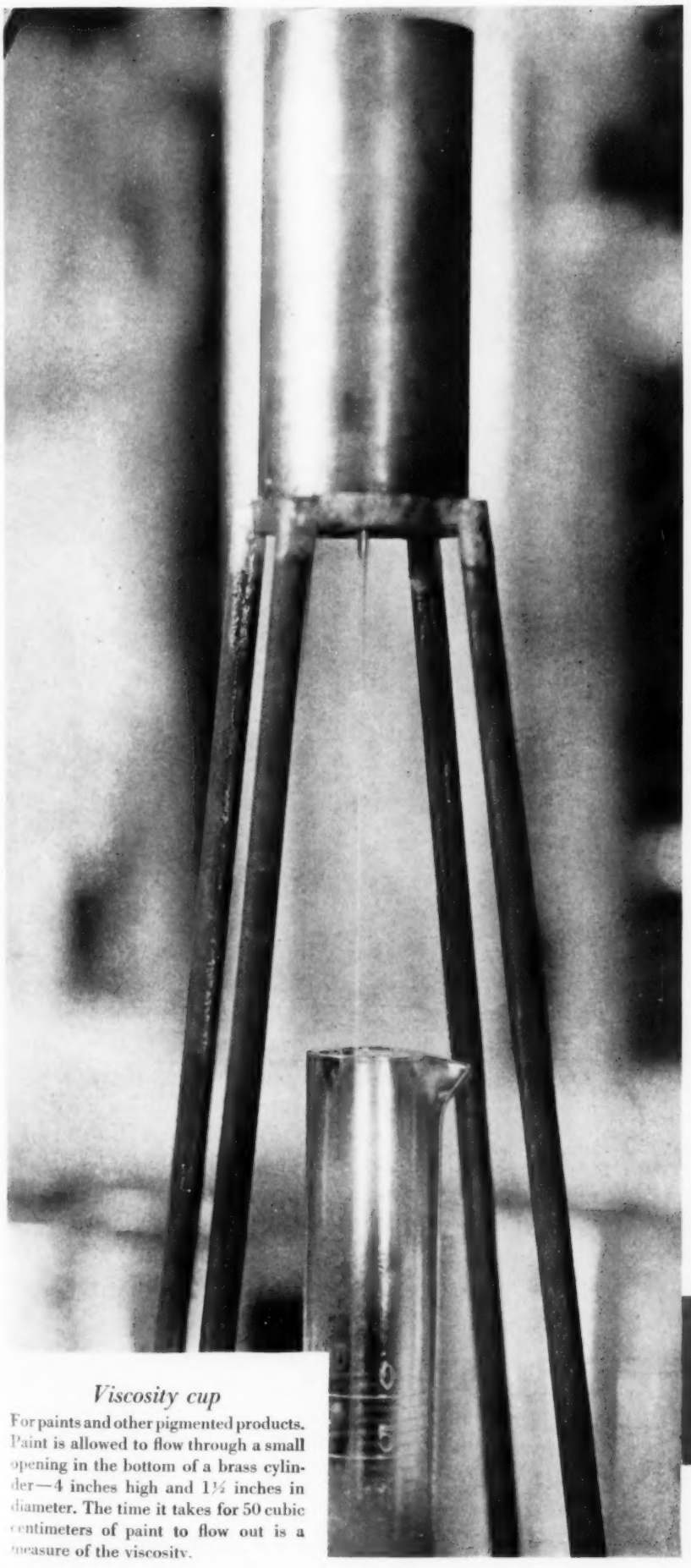
NEW YORK	ATLANTA	CHICAGO	DALLAS	CLEVELAND



Viscosity cup

For paints and other pigmented products. Paint is allowed to flow through a small opening in the bottom of a brass cylinder—4 inches high and 1¼ inches in diameter. The time it takes for 50 cubic centimeters of paint to flow out is a measure of the viscosity.

PAINT VS. SECONDS

"NOT too thick—not too thin." That's the general rule the painter follows if the paint is to brush easily . . . flow together to eliminate brush marks . . . and give a film that dries to a hard, impervious surface of the desired sheen.

But the guesswork can't determine the exact viscosity. So du Pont chemists use the scientifically accurate method which times the flow of a known quantity of paint to a second.

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DU PONT

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ENAMELS PAINTS

Photo by courtesy of The New York Times

Photo by courtesy of The New York Sun

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1. *Delmonico Building.*
   Architects: Goldner & Goldner.
   Electrical Contractor: J. L. Goodrich
2. *Ritz Tower*
   Architect: Emory Roth.
   Electrical Contractors: J. Livingston & Co.
3. *Sherry Netherlands Hotel.*
   Architects & Engineers: Schultze & Weaver.
   Electrical Contractors: J. Livingston & Co.
4. *Savoy Plaza Hotel.*
   Architects: McKim, Mead & White.
   Electrical Engineers: Tenney & Ohmes.
   Electrical Contractors: Walter H. Taverner Corporation.
5. *Brisbane Building.*
   Architect: Emory Roth.
   Electrical Contractors: P. J. Keogan Co., Inc.
6. *Plaza Hotel.*
   Architects: Warren & Wetmore.
   Electrical Contractors: Walter H. Taverner Corporation.
7. *Hotel Pierre.*
   Architects & Engineers: Schultze & Weaver.
   Electrical Contractors: Greer Electric Construction Co.
8. *Squibb Building.*
   Architect: Ely Jacques Kahn.
   Electrical Contractors: Alliance Electric Company, Inc.

A Change—
Not a Correction!
Another "Random Shot"

SOME months ago, we ran an advertisement featuring a photograph, again reproduced in inset, which appeared in the New York Times. All six of the buildings included in this were "Bryant Equipped". Several weeks ago, there appeared in the New York Sun another photograph of the "Plaza Zone", taken from almost the same spot. This is reproduced above. Note the two additions to the skyline—The Hotel Pierre and The Squibb Building. These, too, are "Bryant Equipped". While the New York skyline is constantly changing, those architects and engineers who insist upon the best continue to specify Bryant "Superior Wiring Devices" and contractors who carry out their plans are only too glad to use them, for Bryant Devices, since 1888, have been a standard throughout the world.

A-12

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MANUFACTURERS OF "SUPERIOR WIRING DEVICES" SINCE 1888 - MANUFACTURERS OF HEMCO PRODUCTS

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SLATE-FOR-THE-ROOF

. . . Custom-made

SAM SALVAGE RESIDENCE, GLEN HEAD, L. I., ROGER BULLARD, ARCHITECT

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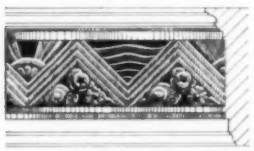

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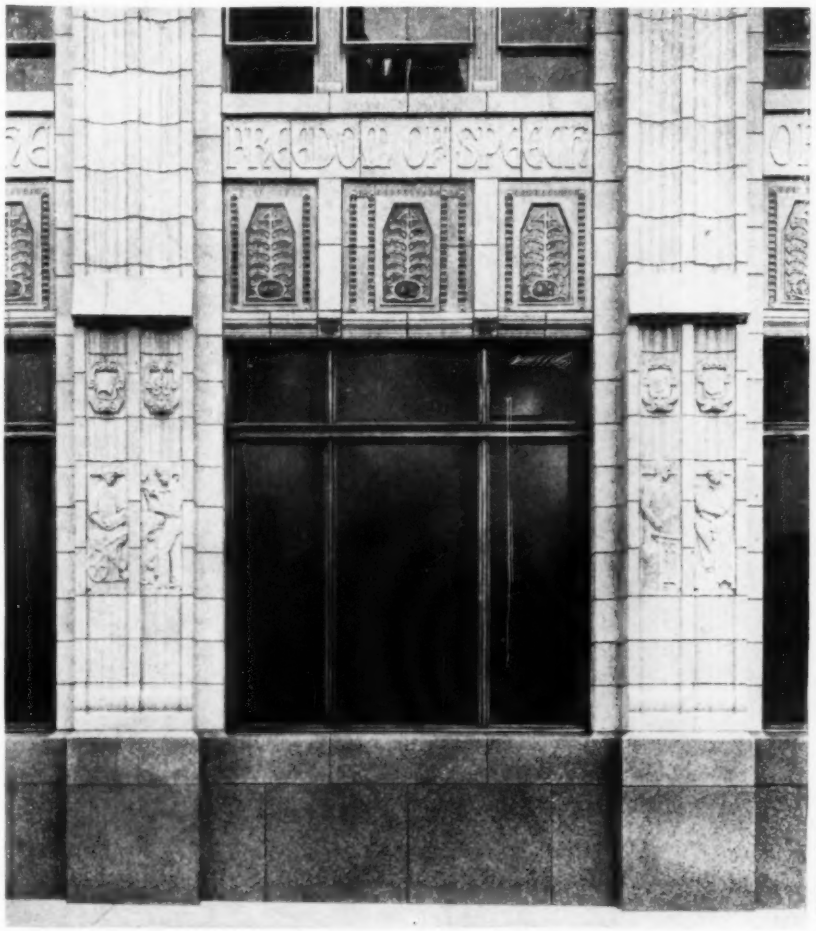
FEDERAL SEABOARD TERRA COTTA



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Contractors.

AN example, in modern design, of how, in color, form and cost Federal Seaboard Terra Cotta meets all requirements . . . The general color is buff multichrome texture. Spandrels are of polychrome in golden yellow and green . . . Attention is directed to the large bas-reliefs at the entrance and in the parapet; all made in one piece.

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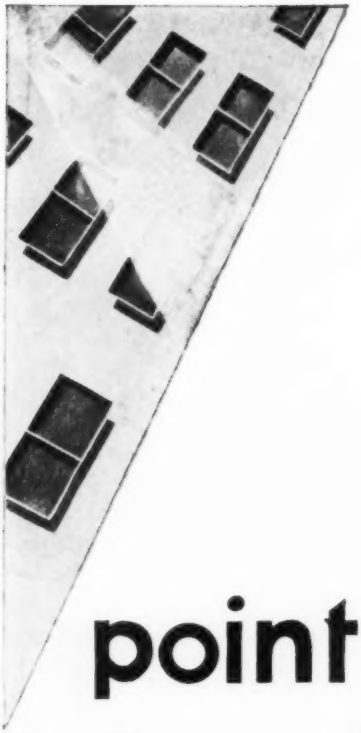

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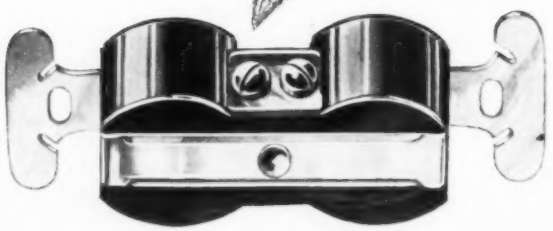
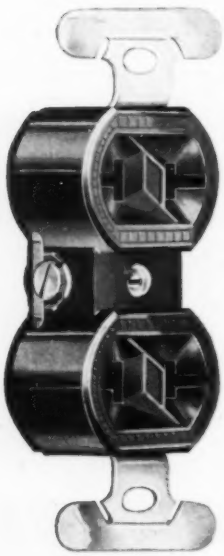


No. 1912-G



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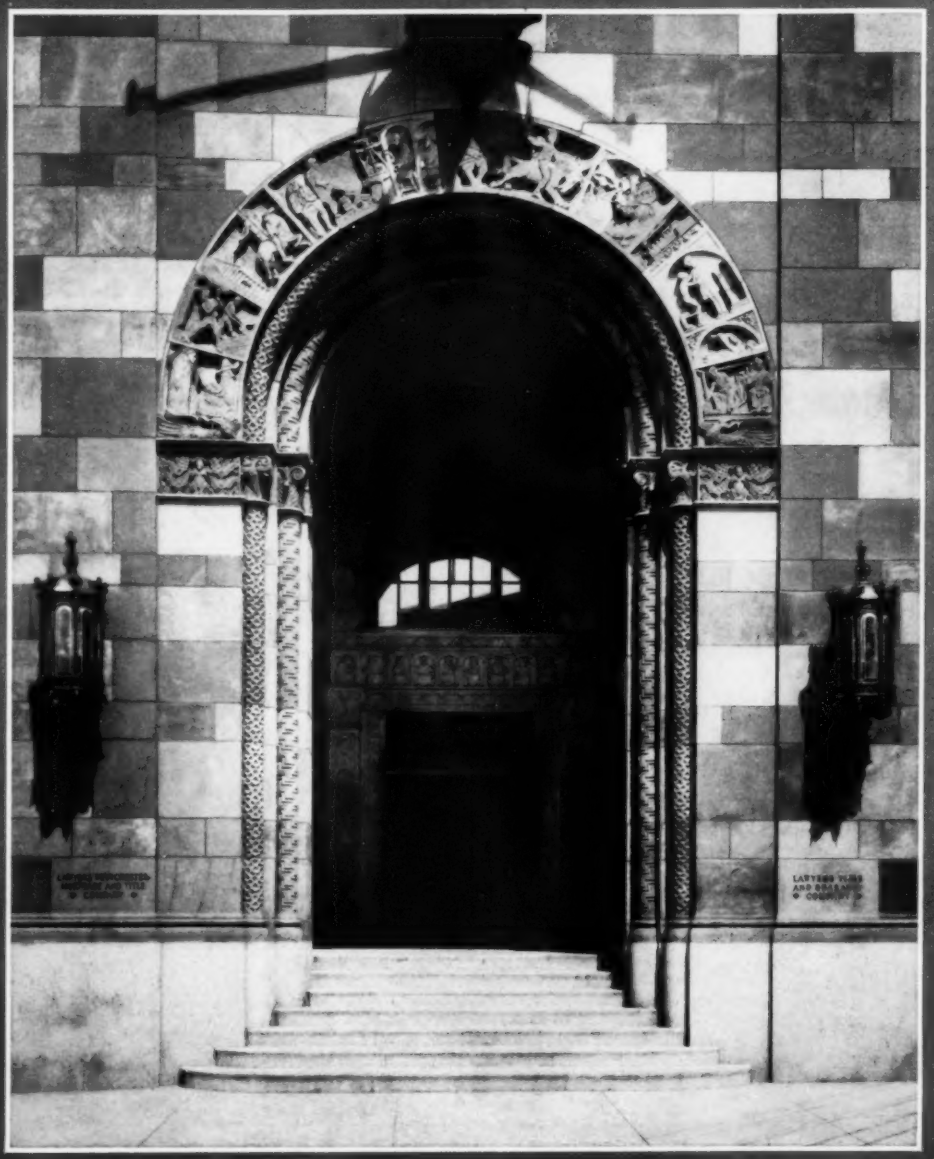

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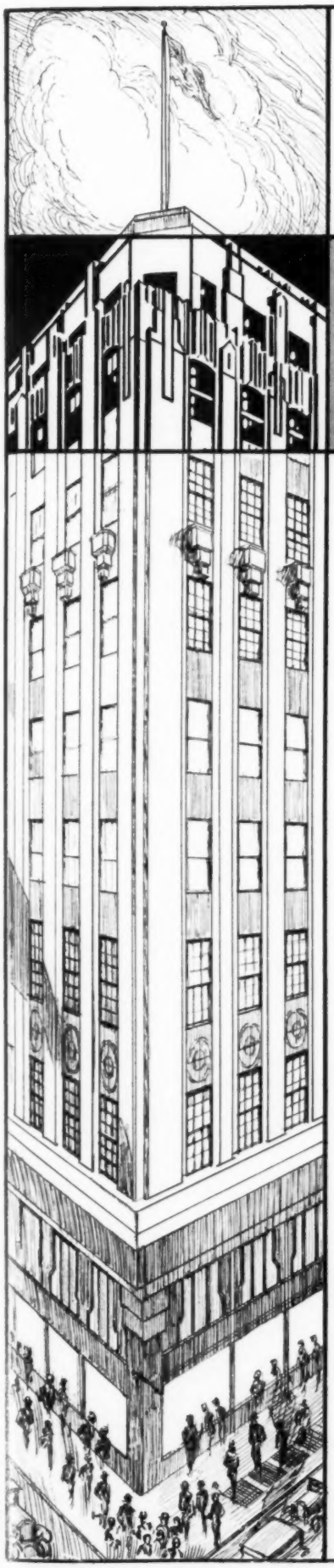

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See pages A 392 to A 401 in 1931 Sweet's Architectural Catalog

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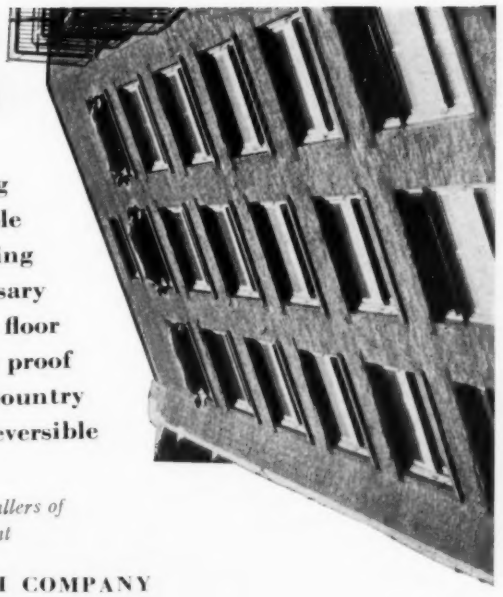

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For 26 years manufacturers and installers of Reversible Window Equipment

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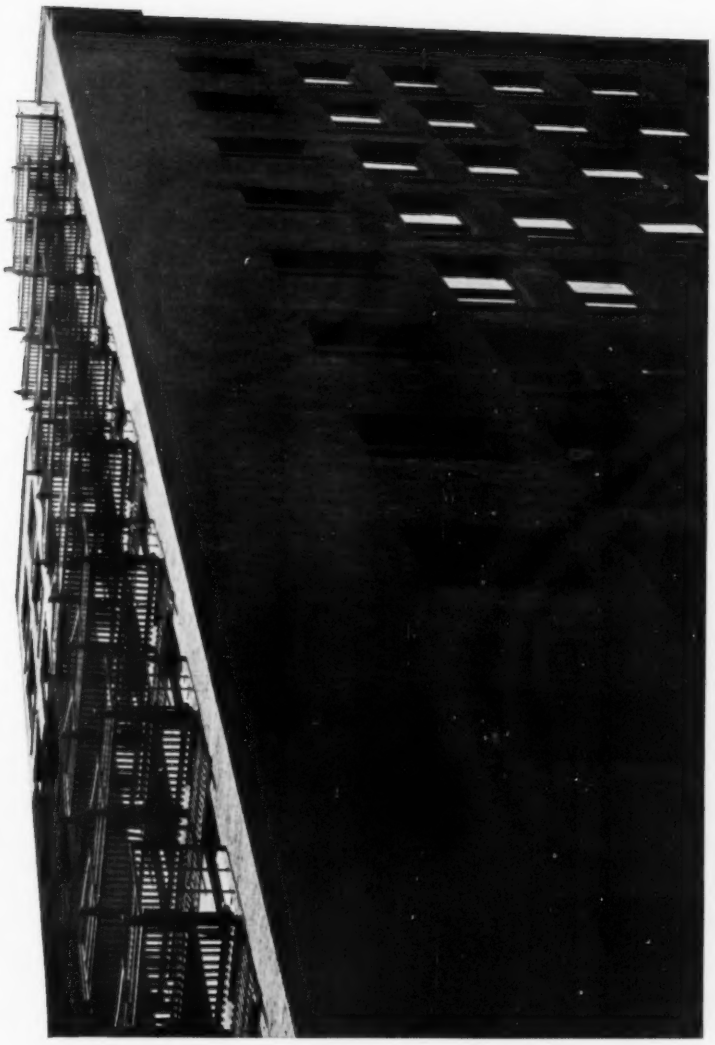

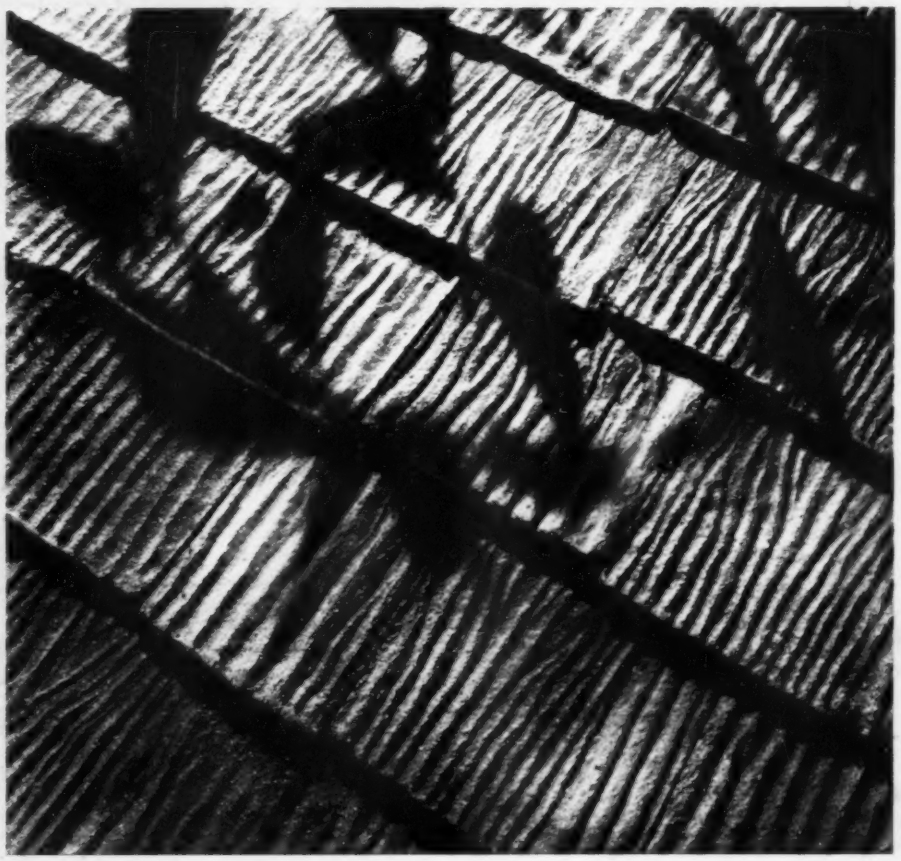

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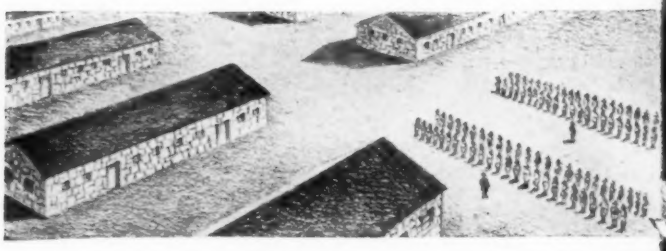

IF the United States Army could be said to worship a fetish in the selection of its equipment, it is that of reliability. Guns, motors, planes, communication devices, must be able to "stand the gaff"—must not fail even under the most difficult conditions. Materials which are purchased and used for training and pre-war activities must measure up to the same standards of dependability that they must meet during actual war times.

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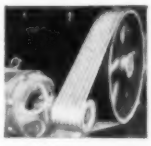

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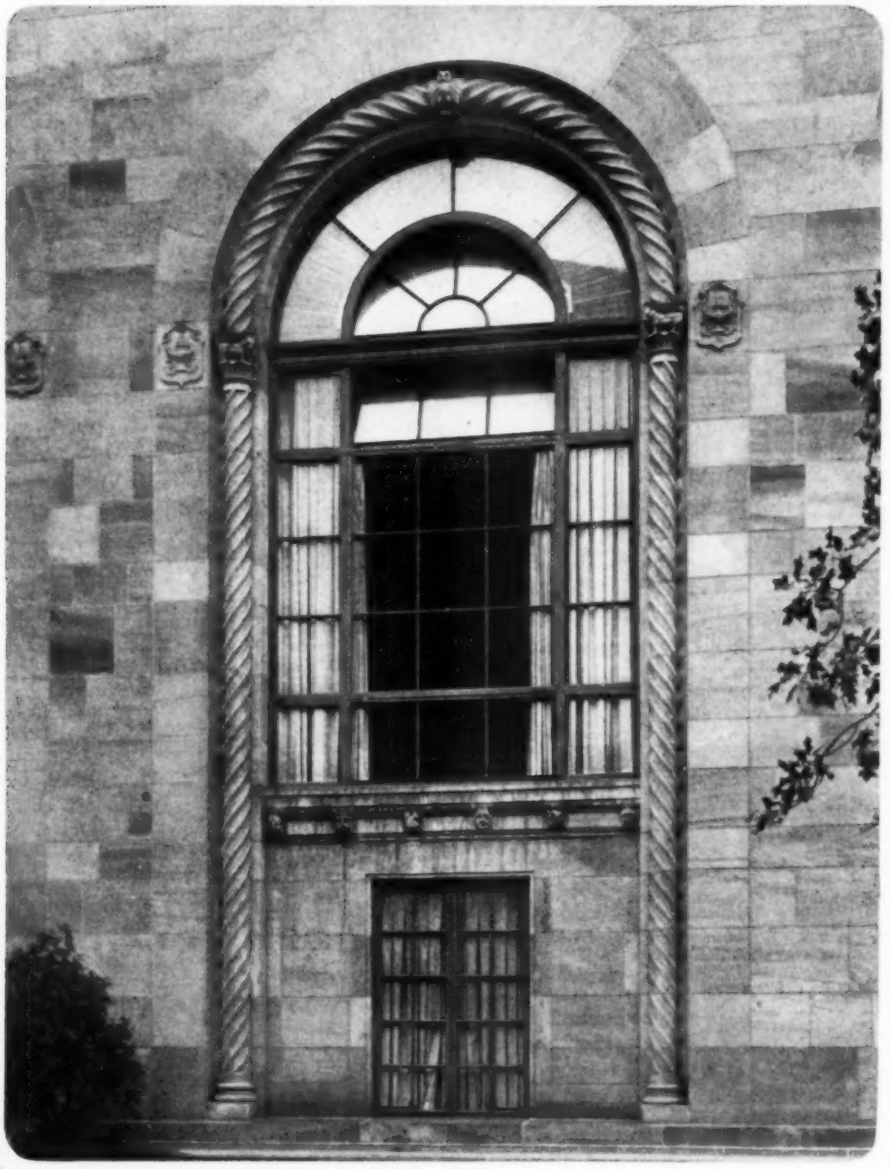

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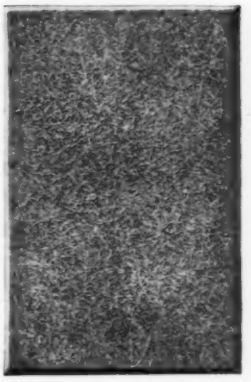

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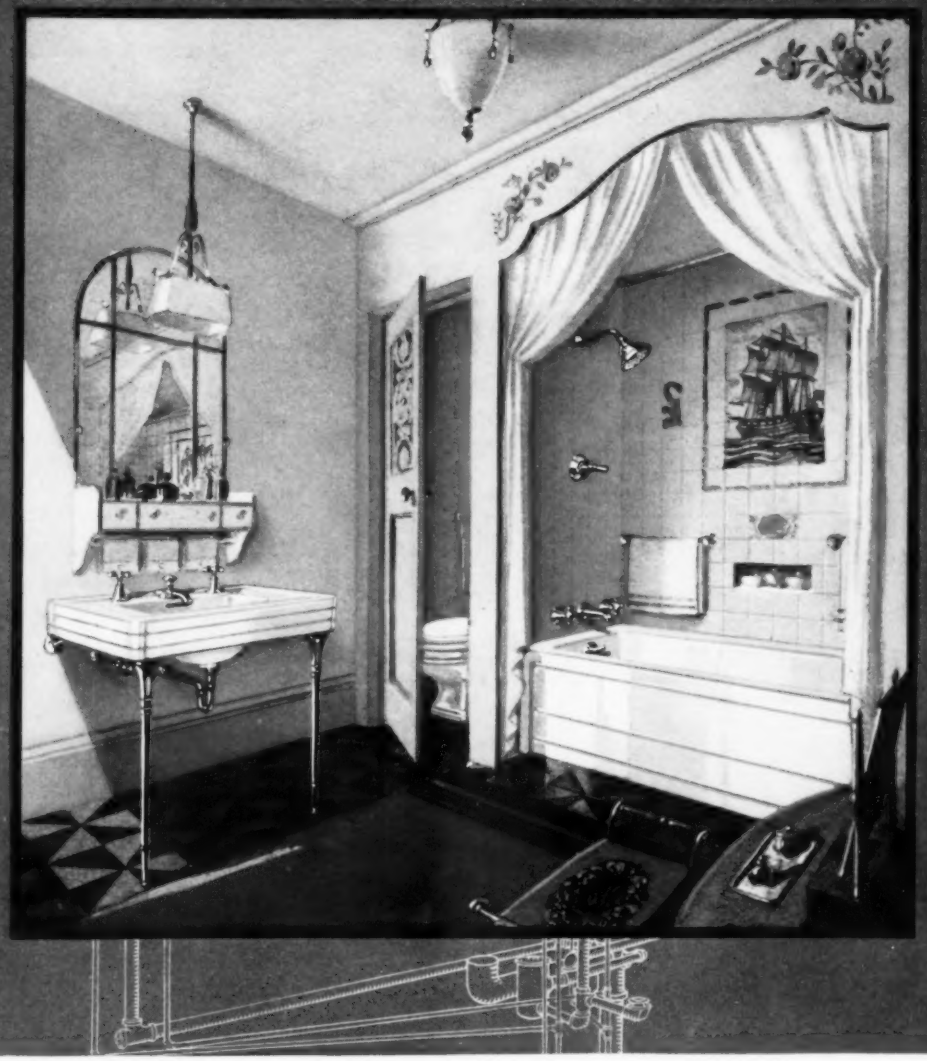

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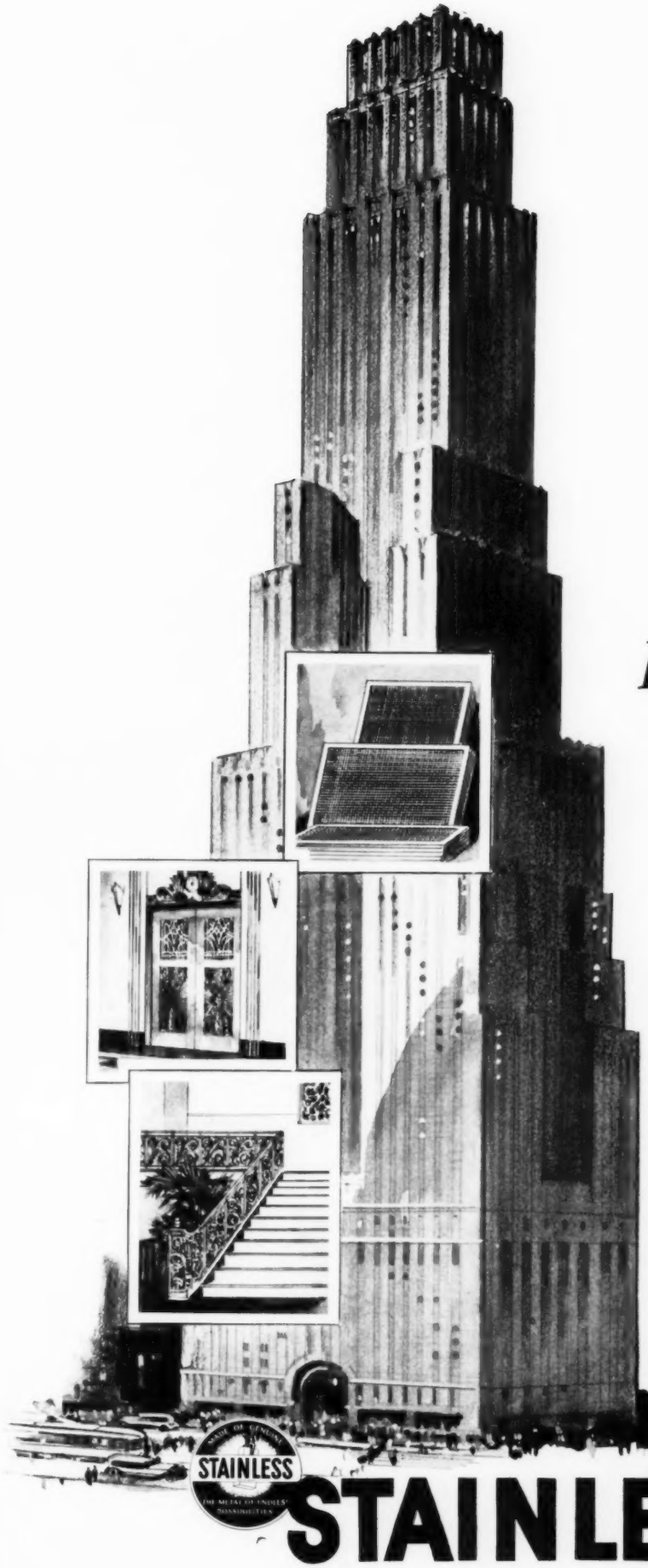

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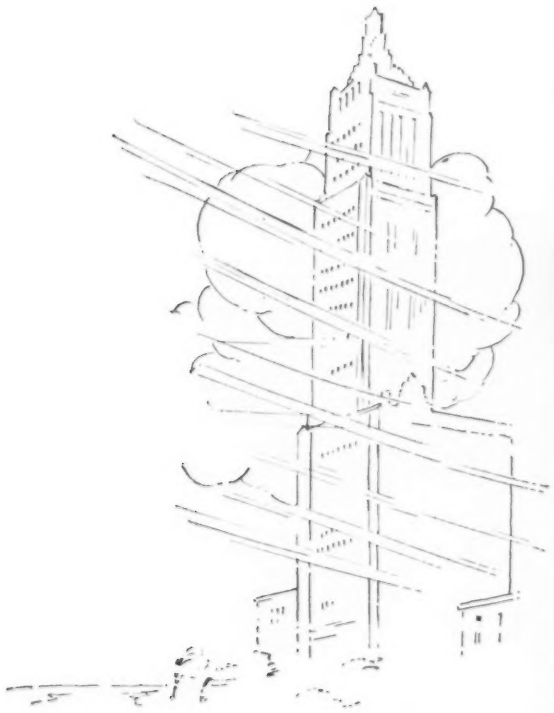

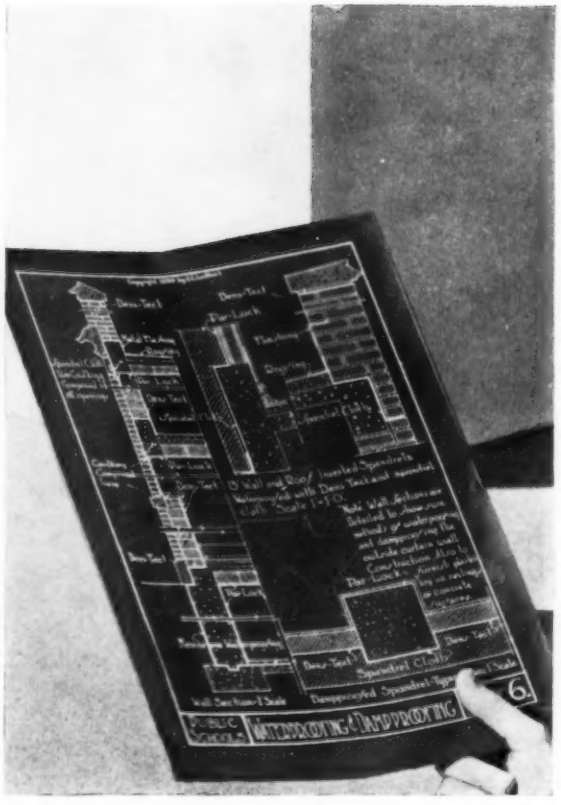

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Actual figures based on U. S. Government Standard Rating, show that on a 1000 foot job, Eastwood Radiation will deliver from 119 to 140 feet *more actual heating surface* than any competitive make.

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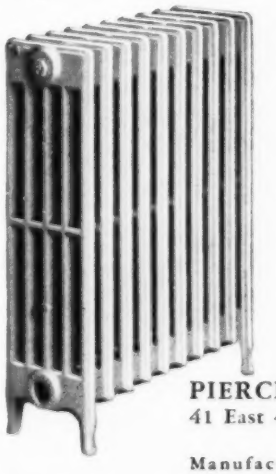

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Views are of Building for Christian Science Benevolent Association for Pacific Coast in San Francisco, California. Henry H. Gutterson, Architect; Walter L. Huber, Structural Engineer; George Wagner, Contractor—all of San Francisco, California

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THE MODERNISTIC MOVEMENT
Plate 4

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Plans and Specifications
by PAUL CRET

RALPH MODJESKI, *Engineer*

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Quiet because it absorbs shock; *quieting* because it deadens sound. . . . Stedman Reinforced Rubber Tile was chosen for the floors in the several studios of WLW, Cincinnati, because it provides a noiseless floor; because it is smooth, foot-sure, easy to move about on; because it is wear-resisting and sanitary; and because it provides 27 effective color types with which any decorative treatment can be achieved. . . Will you accept the book and color charts, complimentary?

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FOR ANY FINISH

SACKS OF SATISFACTION

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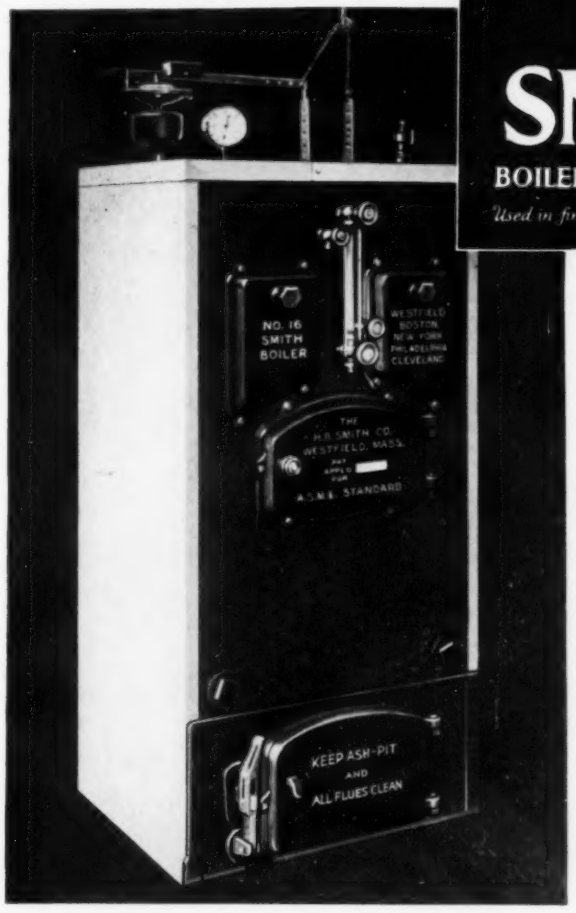

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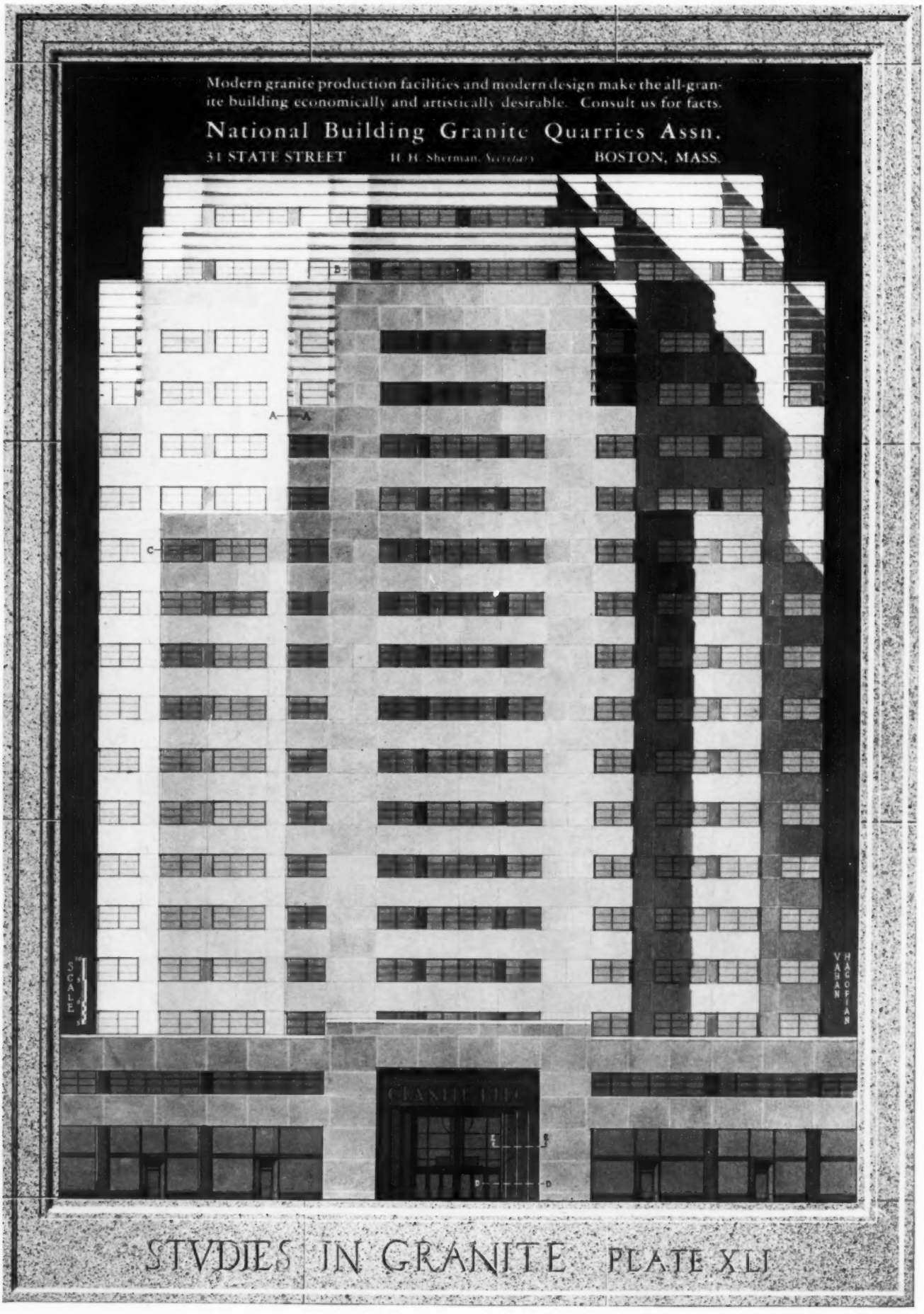
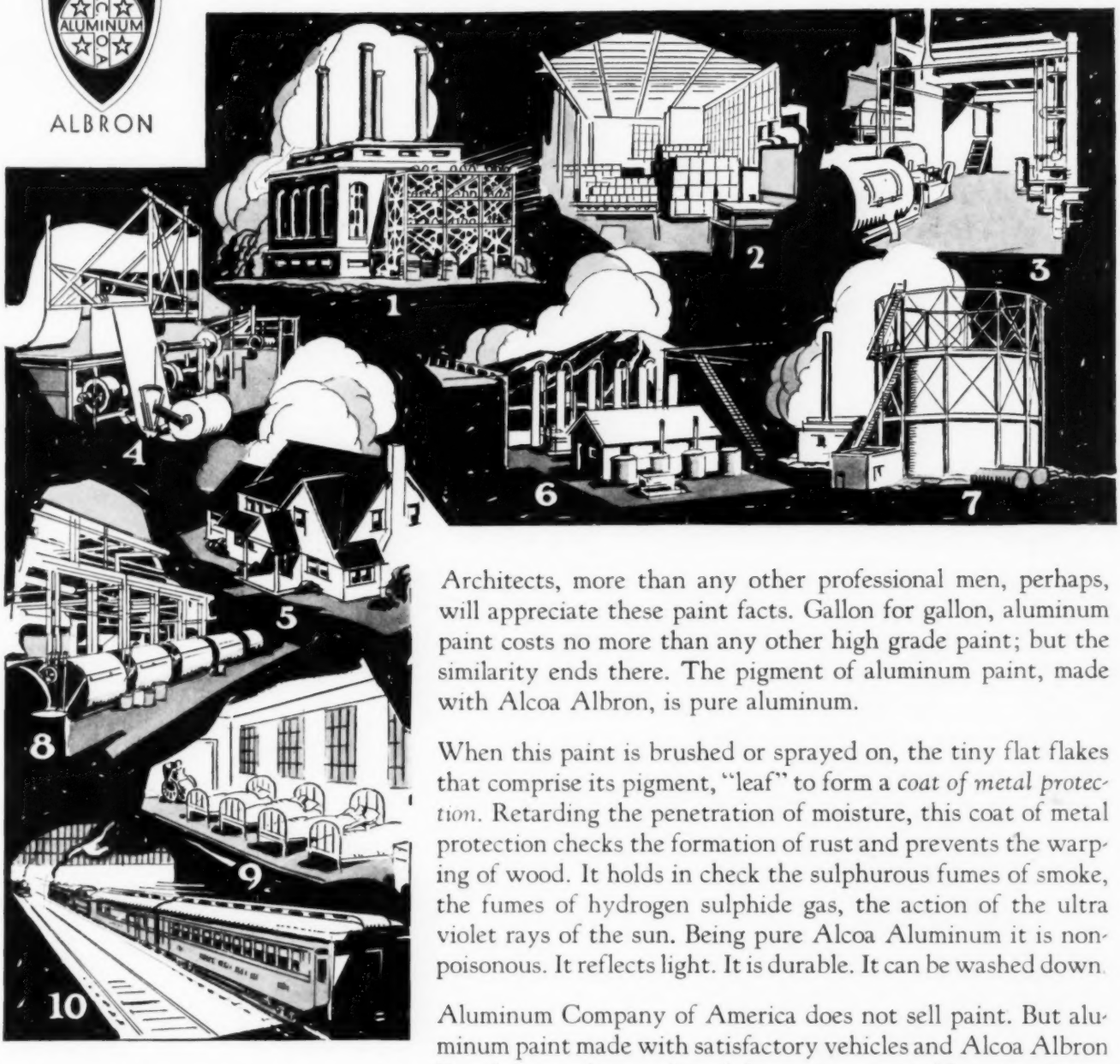


STUDIES IN GRANITE PLATE XLI

Aluminum Paint made with Alcoa Albron Powder meets many "specialized" paint conditions

ALCOA ALUMINUM ALBRON



(1) Public Utility Plants: Resistance to rust on outside structures. Durability. Appearance. (2) Food Plants: Non-poisonous. Cleanliness. Washability. Light reflectivity. (3) Milk Plant: Non-poisonous. Cleanliness. Washability. Light Reflectivity. (4) Textile Plants: Resistance to discoloration from dye-house fumes. Light reflectivity. (5) Residential Structures: As a primer and back-primer for lumber. Holds moisture content within safe limits. (6) Oil Refineries: Resistance to hydrogen sulphide fumes. Heat reflectivity. Appearance. (7) Gas Plants: Appearance. Heat Reflectivity. Resistance to moisture penetration. Checking formation of rust. (8) Chemical Plants: Resistance to attack of acid fumes. Durability. (9) Institutions: Prime coat for lumber. Finish coat for metal. Retards penetration of moisture. (10) Terminals: Resistance to sulphurous fumes and smoke. Durability.

Architects, more than any other professional men, perhaps, will appreciate these paint facts. Gallon for gallon, aluminum paint costs no more than any other high grade paint; but the similarity ends there. The pigment of aluminum paint, made with Alcoa Albron, is pure aluminum.

When this paint is brushed or sprayed on, the tiny flat flakes that comprise its pigment, "leaf" to form a *coat of metal protection*. Retarding the penetration of moisture, this coat of metal protection checks the formation of rust and prevents the warping of wood. It holds in check the sulphurous fumes of smoke, the fumes of hydrogen sulphide gas, the action of the ultra violet rays of the sun. Being pure Alcoa Aluminum it is non-poisonous. It reflects light. It is durable. It can be washed down.

Aluminum Company of America does not sell paint. But aluminum paint made with satisfactory vehicles and Alcoa Albron Powder may be purchased from most reputable paint manufacturers, jobbers and dealers. Be sure the pigment portion is Alcoa Albron and is so designated.

Let us send you the booklets, "Aluminum Paint, the Coat of Metal Protection", and "Aluminum Paint Specifications", A.I.A. File No. 25-B-252. ALUMINUM COMPANY *of* AMERICA; 2467 Oliver Building, PITTSBURGH, PENNSYLVANIA

ALCOA ALBRON
POWDER FOR
ALUMINUM PAINT

Comfort and fuel economy combined in Dunham Differential Heating

THIS New York office building, the home of Warner Bros. Pictures Inc., First National Pictures Inc., Vitagraph, Inc., and Stanley Co. of America, was especially planned for office and film exchange purposes, and contains elaborate film vaults for storage. It is equipped with a Dunham Differential Heating System. The engineer's letter is typical of the comments of experienced operating men.

PHONE CHICKERING 2200

WARNER BROS
PICTURES, INC
Home Office
VITAGRAPH, Inc.
321 WEST 44th STREET
NEW YORK, N. Y

May 17th, 1930

C. A. Dunham Company,
New York City, N. Y.

Gentlemen:

After three seasons of day and night operation your Differential system has done what you claimed for it and more. We have not found it necessary to replace any part, in fact the parts do not show any wear. It is very easy to keep moderate temperatures with the system according to weather conditions. I do not know of any reasonable thing expected of a heating system that your Differential system can not deliver. As a fuel saver in comperison with a straight vacuum system 25% is a conservative figure on coal saving.

Yours very truly,
W. Schoenfelder Supt.

VITAPHONE

321-29 West 44th Street
New York City
Architect: Thomas W. Golding
Builders: Fred T. Ley & Co.
Heating Contractor: Jas. H. Martin

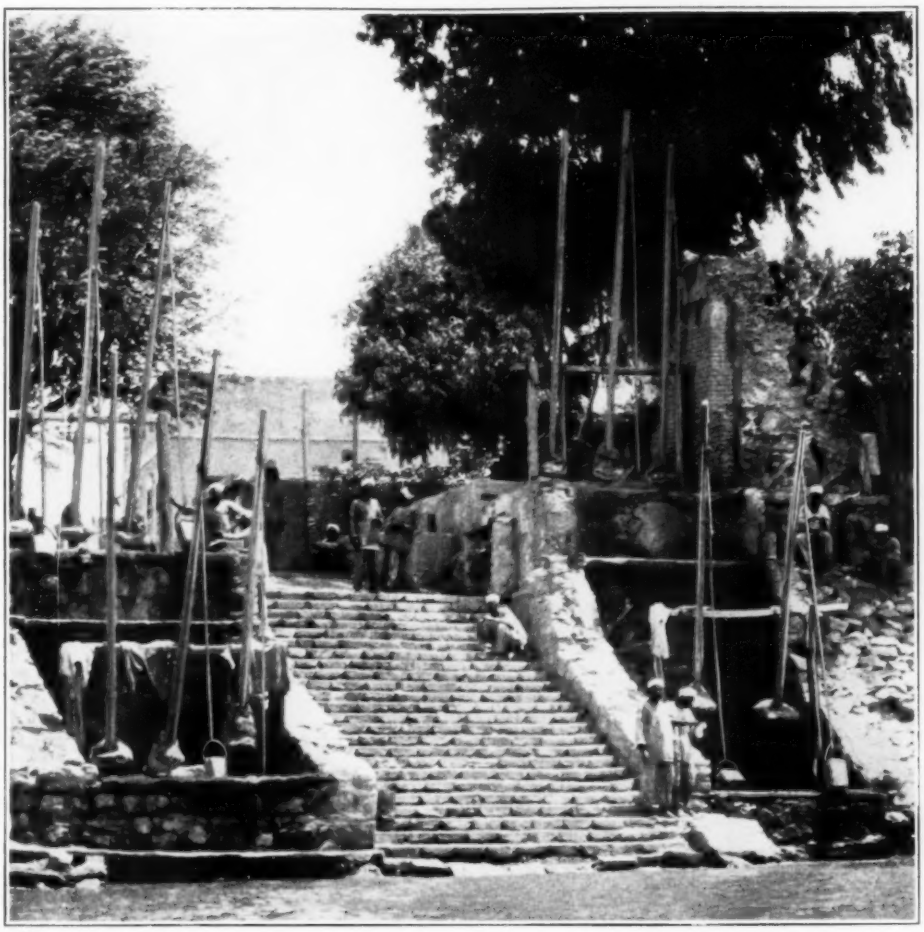
C. A. DUNHAM CO.

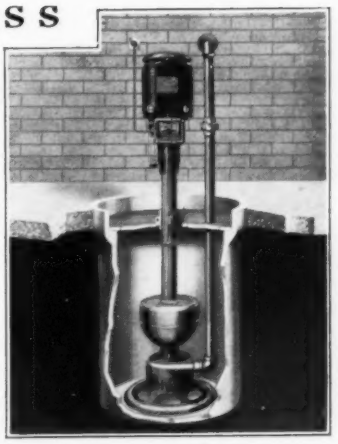
Dunham Building

450 East Ohio Street **Chicago, Illinois**

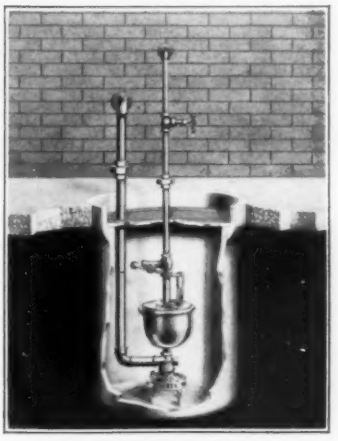
Many existing heating plants can be changed over to Differential operation, improving the quality of service and reducing fuel bills 25 to 40 per cent. Write for complete data.

CONTRASTS IN INDUSTRIAL PROGRESS





Many architects specify these Penberthy Pumps for draining seepage water from basements, elevator pits, piping tunnels, etc.

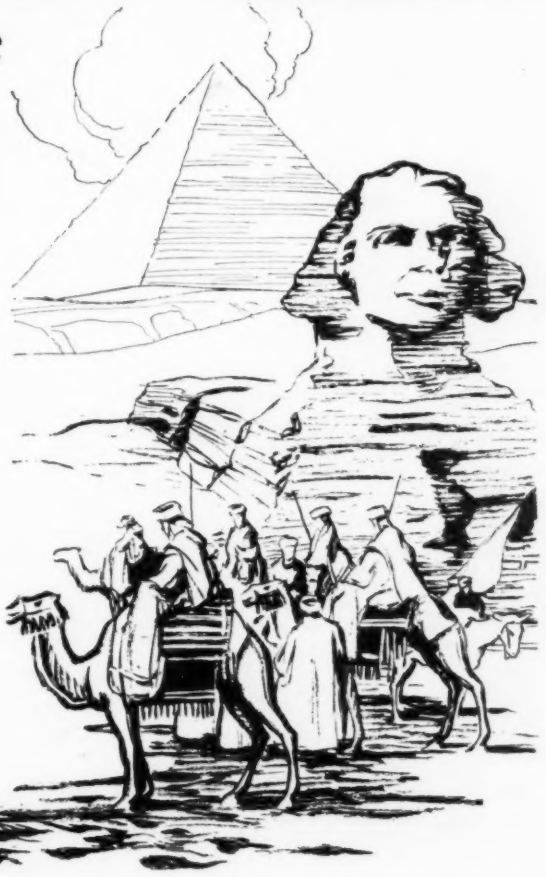


Lifting water from the River of the Pharaohs

ALONG the Nile they call these Shadufs, and they use them for elevating water into the irrigation ditches. At this particular point the Shadufs have to be operated in two stages even though the "operating head" is not more than 15 feet.

Could elevating water be made more difficult than this? One small, compact Penberthy Pump (either an Automatic Electric or Automatic Water Operated unit) could displace this whole installation of Shadufs and still be idle most of the time.

One of the salient advantages of these Penberthy Pumps lies in the fact that they can remain idle indefinitely without their efficiency or smoothness of operation being affected. Corrosion is powerless to deteriorate Penberthy Pumps because they are copper and bronze throughout.



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PENBERTHY PRODUCTS

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A handsome, comfortable Bonded Floor in one of the New York shops of The Hilton Co., Inc.

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Bonded Floors are floors of Sealex Linoleum and Sealex Treadlite Tile, backed by a Guaranty Bond issued by the U. S. Fidelity and Guaranty Company. Authorized Contractors of Bonded Floors are located in principal cities.

Without question, one of the most inexpensive ways an architect can make a store or office look successful—progressive—up-to-date—is to specify a colorful, modern cork-composition floor. This type of floor offers many possibilities for creating "atmosphere"—that intangible yet necessary asset of modern business.

Bonded Floors come in realistic marble designs and rich tile effects—a wide choice of patterns, ready made or designed to order. These durable, quiet floors provide comfort underfoot for employees and customers at moderate cost.

Let us explain how and why Bonded Floors will more than satisfy you. Write our Department F.

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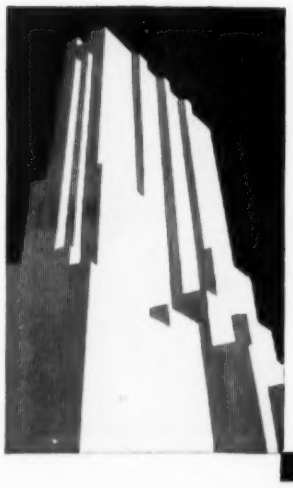
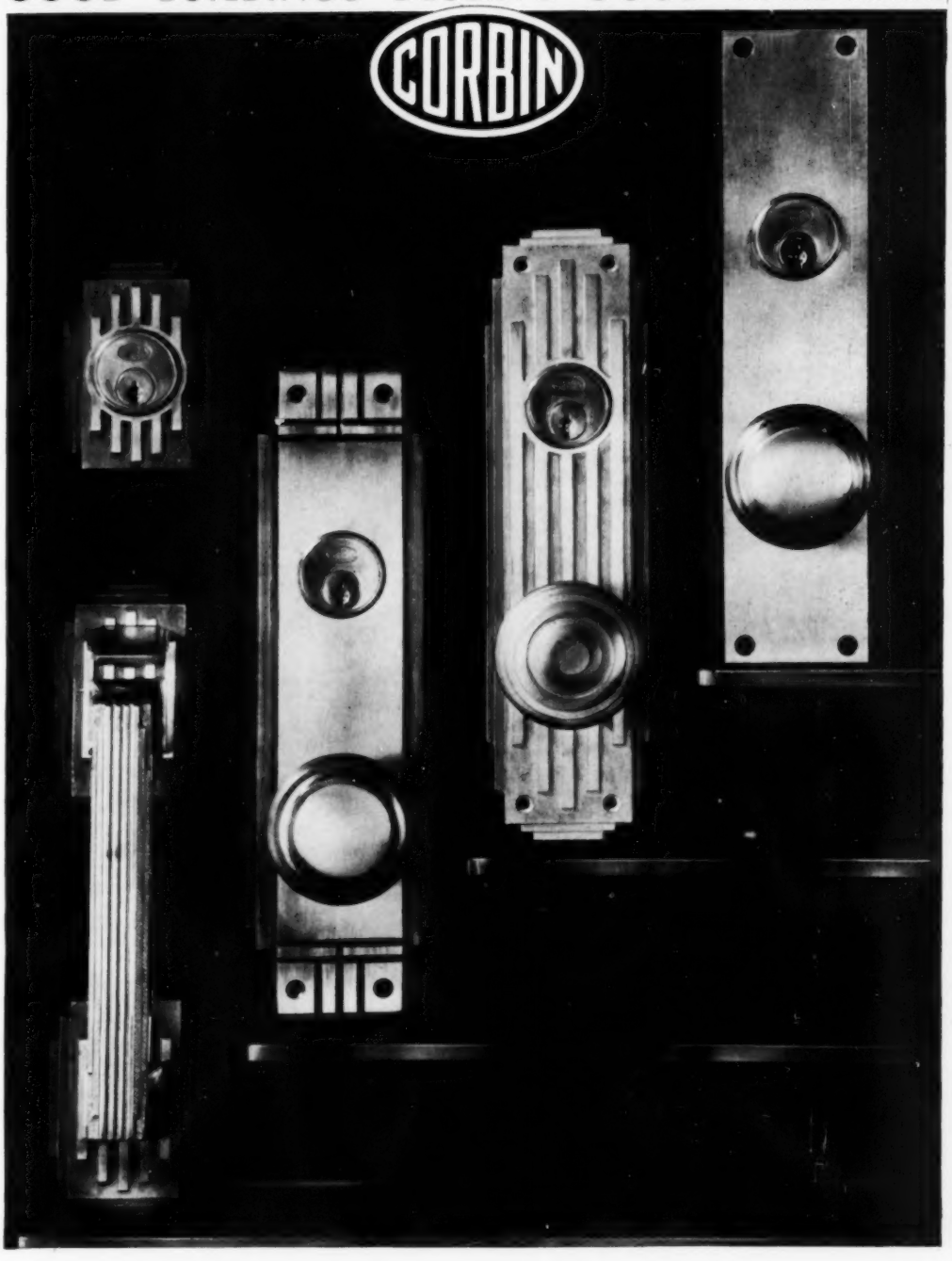


- - Corbin designs you will find modern in their motifs but old-fashioned in their quality

GOOD BUILDINGS DESERVE GOOD HARDWARE



Photographed are (left to right) **"Vertex"** *door handle,* **"Gargan"** *knob and escutcheon,* **"Vertex"** *knob and escutcheon and* **"Gotham"** *knob and escutcheon.*

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WISDOM

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THIS vigorous, almost primitive work of art was carved by a young Cherokee Indian, picturesquely named "Going Back Chiltoskey," a tenth-grade student at Haskell Institute, Lawrence, Kansas. The wood used is the same fine imported mahogany-like hardwood that is sold by the Indiana Quartered Oak Company and its sales agents as "Philippine INDOAKO Wood".

There is an obvious symbolism in this carving. The owl stands for wisdom, and wisdom indeed it was that was shown in the selection of the wood. For INDOAKO is a wonderful wood to work with—not only for carving, but for a multitude of uses in interior architecture. Its beautiful ribbon grain and its exquisite coloring single it out as *the* wood for modern paneling, cabinet work, floors and doors—in short, for all interior trim as well as for private and public furniture. Convince yourself! The coupon will bring you a folder (with sample) supplementing our catalog on page B—2262 of Sweet's.

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KOHLER PLUMBING FIXTURES AND FITTINGS THROUGHOUT

LEFT TO RIGHT
CASA LOMA APARTMENT HOTEL, 103 W. Ward Parkway, Kansas City, Mo. *Architect*, W. A. Besecke. *Builder*, McCanles Bldg. Co. *Owner*, Pickering Lumber Co. *Jobber*, Kellogg-Mackay Co. *Plumber*, W. Lutz.
CASA LOMA W. APARTMENT HOTEL. *Architect*, W. A. Besecke. *Builder*, McCanles Building Co. *Owner*, McCanles Building Co. *Jobber*, A. Y. McDonald Mfg. Co. *Plumber*, Laitner P. & H. Co.
BIARRITZ APARTMENT HOTEL. *Architect*, W. A. Besecke. *Builder*, McCanles Building Co. *Owner*, McCanles Building Co. *Jobber*, A. Y. McDonald Mfg. Co. *Plumber*, Laitner Plumbing & Heating Co.
VILLA RIVIERA APARTMENT HOTEL. *Architect*, A. H. Gentry. *Builder*, McCanles Building Co. *Owner*, McCanles Building Co. *Jobber*, A. Y. McDonald Mfg. Co. *Plumber*, Laitner P. & H. Co.
VILLA LOCARNO APARTMENT HOTEL. *Architect*, A. H. Gentry. *Builder*, McCanles Building Co. *Owner*, Locarno Investment Co. *Jobber*, Kellogg-Mackay Company. *Plumber*, Laitner P. & H. Co.
VILLA SERENA APARTMENT HOTEL. *Architect*, A. H. Gentry. *Builder*, McCanles Building Co. *Owner*, Pickering Lumber Company. *Jobber*, A. Y. McDonald Mfg. Co. *Plumber*, Laitner P. & H. Co.

SIX KANSAS CITY APARTMENTS IN A ROW... ALL KOHLER EQUIPPED

BUILDERS state what architects frequently have claimed: all-Kohler installations make good salesmen. Home hunters reason, rightly, that if fixtures and fittings are efficient, safe, fine through and through, the same care prevails in the rest of the house.

Witness the six apartment houses recently erected by the McCanles Building Company, Kansas City, all on one street in a fashionable district. Modern, beautifully appointed, they embody all the advantages of informed and intelligent building practice. And in every one of them Kohler products are used *throughout!* A total of over 4000 fixtures and fittings—exquisitely designed, and therefore gratifying to the most critical tenant; efficient and permanent, which means freedom from expense or worry for the owner.

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Kohler Co. *Founded* 1873. Kohler, Wis.—*Shipping Point*, Sheboygan, Wis. — *Branches in principal cities.* . . . Look for the Kohler trade-mark on every fixture and fitting.

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PLUMBING FIXTURES

It Is a GOOD Gas Range That Has This Red Wheel

Patents Pending

TIFFIN Model CASH PRICE $99.75 except in extreme Southeast, Rocky Mountains and beyond

The TIFFIN Model . . . .

A new Magic Chef at a lower price

WOMAN'S desire for a modern and beautiful kitchen won universal response to the beauty appeal of the MAGIC CHEF first announced a year ago. Now a new MAGIC CHEF . . . the TIFFIN . . . in a more compact and convenient size . . . has been created which makes MAGIC CHEF charm and style available to the builder at a substantially lower price.

The Tiffin Model of the MAGIC CHEF is delightfully modern in design, daintily harmonious in color scheme, charming and graceful as a piece of fine furniture, yet built so conveniently compact that it will fit the smaller kitchen and be in perfect keeping with its proportions.

Patents Pending

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Like the larger MAGIC CHEF models, the new Tiffin is beautifully enameled throughout. The exterior finish is in Old Ivory with Verd Antique marble trim. The handles are of cool, onyx green bakelite mounted on chromium finished fittings that will not tarnish. A new type folding cover conceals the cooking top, giving a smooth, clean appearance to the stove when not in use.

With all its attractive style the Tiffin is thoroughly serviceable and complete with the modern MAGIC CHEF features including the famous Lorain (Red Wheel) Oven Heat Regulator, the Insulated Oven and Broiler, the Safety-Type Valves, the reversible, rackless Broiler Pan and the roomy Service Drawer.

MAGIC CHEF is sold by dealers and gas companies wherever gas is available. It can also be used in non-gas-served territories with tank gas service. Write for full information.

Send name and address for free copy of booklet showing modern kitchens.

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RUSSWIN

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General Contractors: Jarl & Hammil
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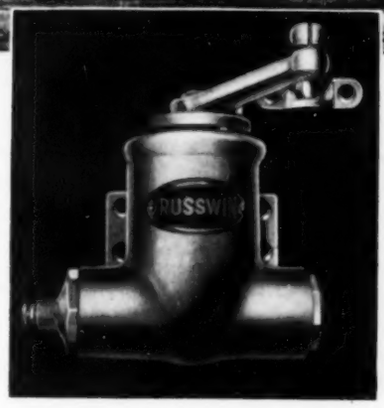

The RUSSWIN Door Closer is a fitting example of the rugged sturdiness, fine workmanship, parts and materials that enter into every piece of RUSSWIN Hardware.

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For the architect's convenience, Russwin Hardware is illustrated and described in Sweet's Catalogue — pages C-3137; C-3216.

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Hardware that lasts – Base Metals of Bronze or Brass

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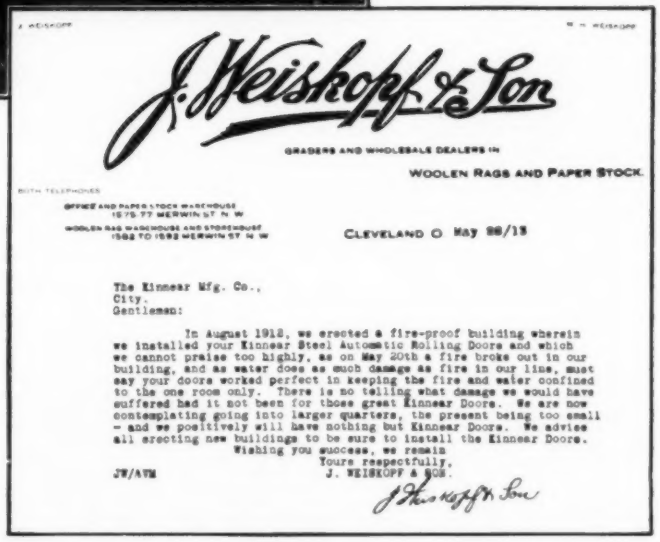
—yet they stopped two serious fires!

Unretouched photographs, taken April 8th, 1930, of the Kinnear Automatic Rolling Doors installed in the Weiskopf Building in 1912, as they appear after eighteen years of continuous service and fire protection duty.

JUST eight months after they were installed (in 1912) the Kinnear Automatic Rolling Doors in the Weiskopf Building received their first test. True to form, they confined the fire and water to one room. Some time later a second fire broke out, and again the Kinnears saved the day.

Had they been rendered useless by either fire they would have been well worth their cost—but, Kinnear Doors are made of sturdy stuff. Consequently, they are still in good condition, ready to choke off a third fire in its incipiency, should it start.

Kinnear Automatic Doors do double duty, functioning as service doors by day and as fire doors by night and day. Descriptive literature and estimates furnished without charge or obligation.



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Wishing you success, we remain
Yours respectfully,
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ROLLING DOORS

THE KINNEAR MANUFACTURING CO.
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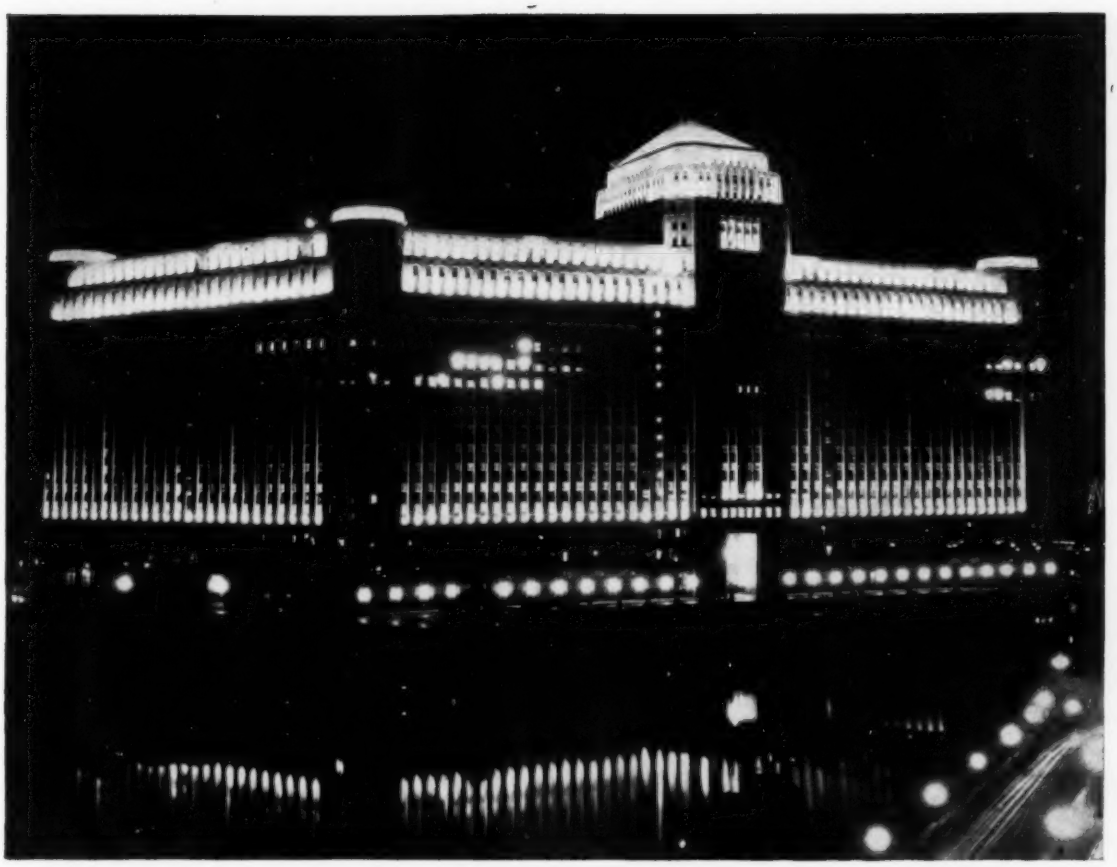

Merchandise Mart
Chicago, Ill.

Graham, Anderson, Probst and White
Architects

Substantially one half of the wall area of the Merchandise Mart—largest building in the world—is of

TERRA COTTA

This includes dark green spandrels throughout, heroically scaled ornament, the entire third and fifteenth stories with their decorations, etc.

The extended use of gold, color and ornamentation made possible by terra cotta obviously sets the building apart from its colorless and therefore less modern neighbors.

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Originally published in 1918, this book promptly became the recognized authority on the subject of Hospital Planning. The revised edition was printed in 1921 and this second edition has been entirely exhausted. The third edition, published in November, 1928, represents an entire rewriting of all subjects and an increase from 224 pages in the first edition and 380 in the second edition to 550 in this new edition, with 660 illustrations of plans, details and photographs.

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Probably no abler exponent or keener observer than Mr. Edward F. Stevens, of Boston, could be selected to write so valuable and indeed indispensable a book. Known throughout both Europe and America as a leading architectural authority on Hospital construction and equipment, whose specialized genius is represented by some of the most perfected and noblest edifices extant among modern Hospitals, he has approached his subject from a most practical standpoint, selecting with discrimination and discussing in full detail.

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119 West 40th Street, New York.

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A.R. 12-30

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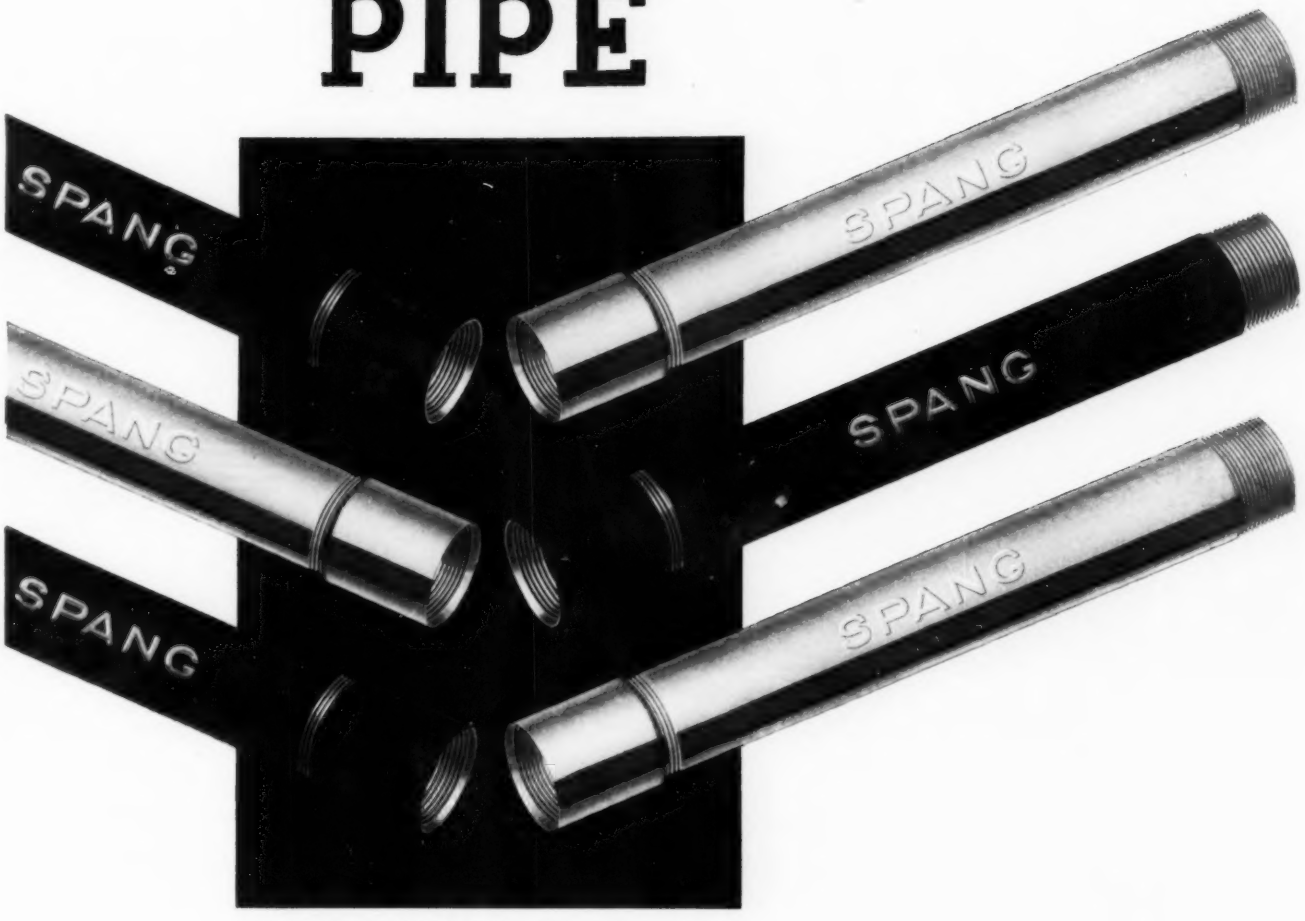
PIPE



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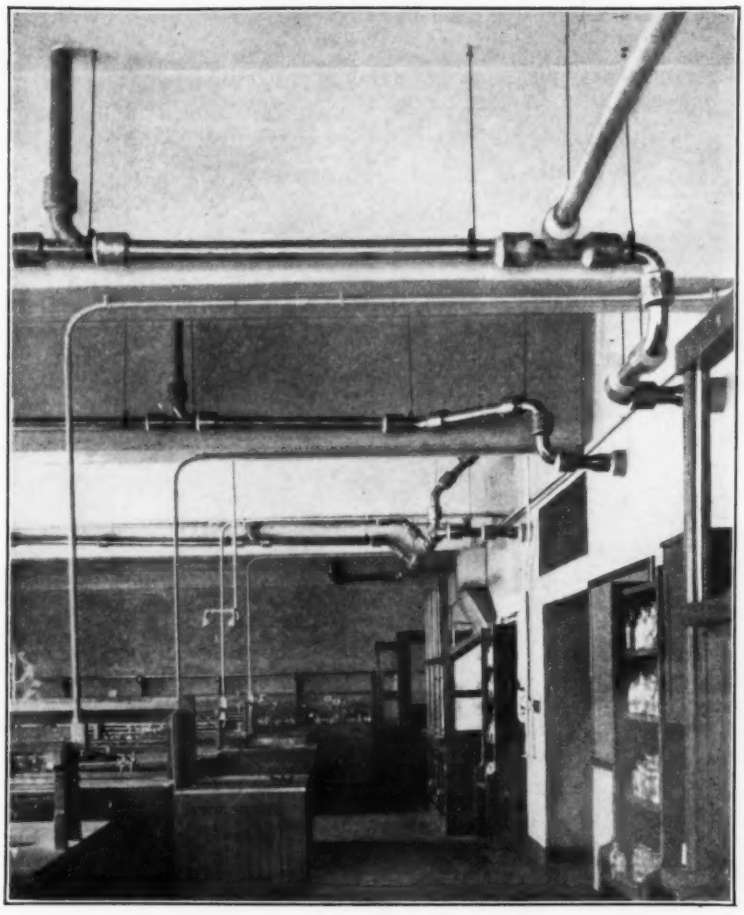

View in Chemistry Laboratory—Ohio State University.
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Hygiene Building
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NEW YORK UNIVERSITY
Chemistry Building
WASHINGTON UNIVERSITY
Biology University
DUKE UNIVERSITY
Chemistry Building
PURDUE UNIVERSITY
Chemistry Building
Pharmacy Building
PENN STATE COLLEGE
Chemistry Building
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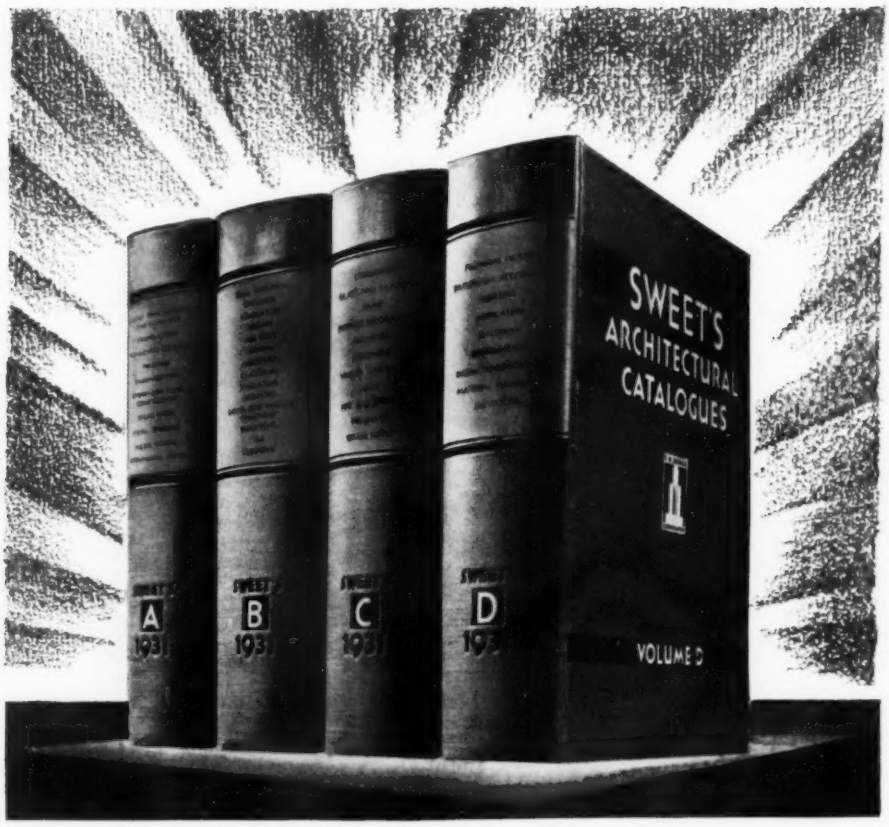

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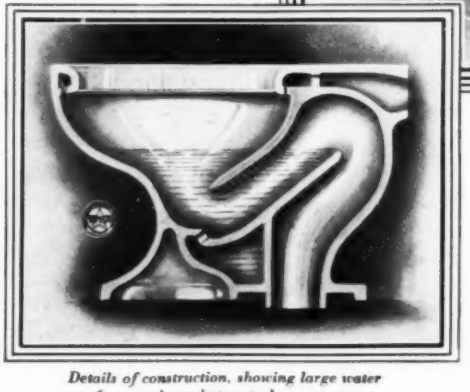

Details of construction, showing large water surface and unobstructed passageway.

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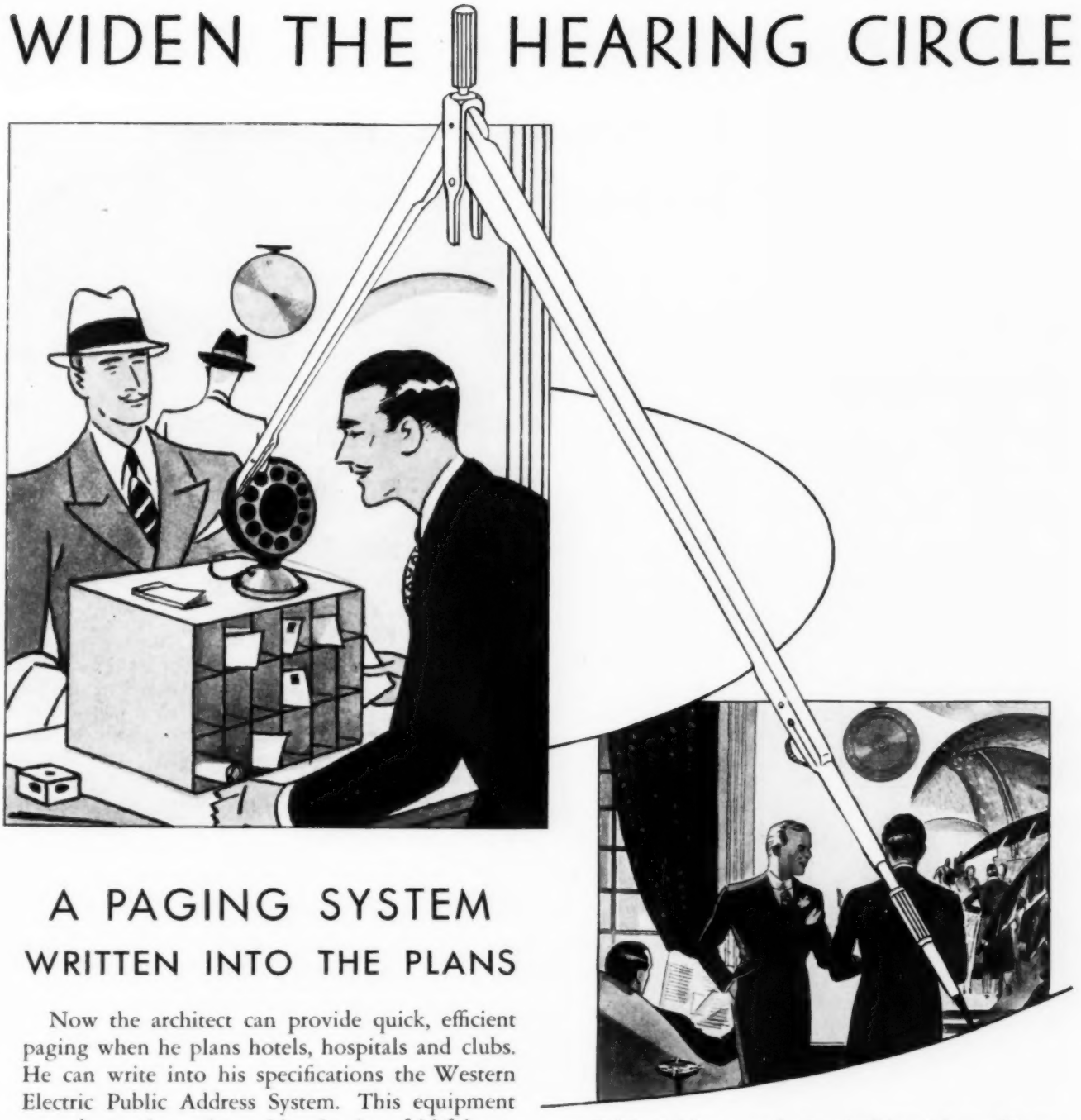

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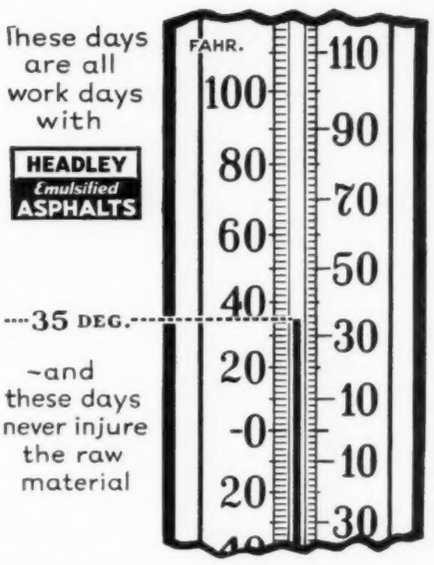

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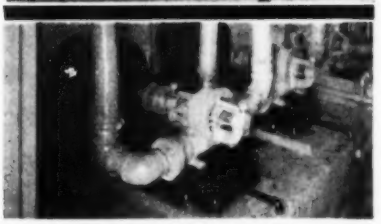

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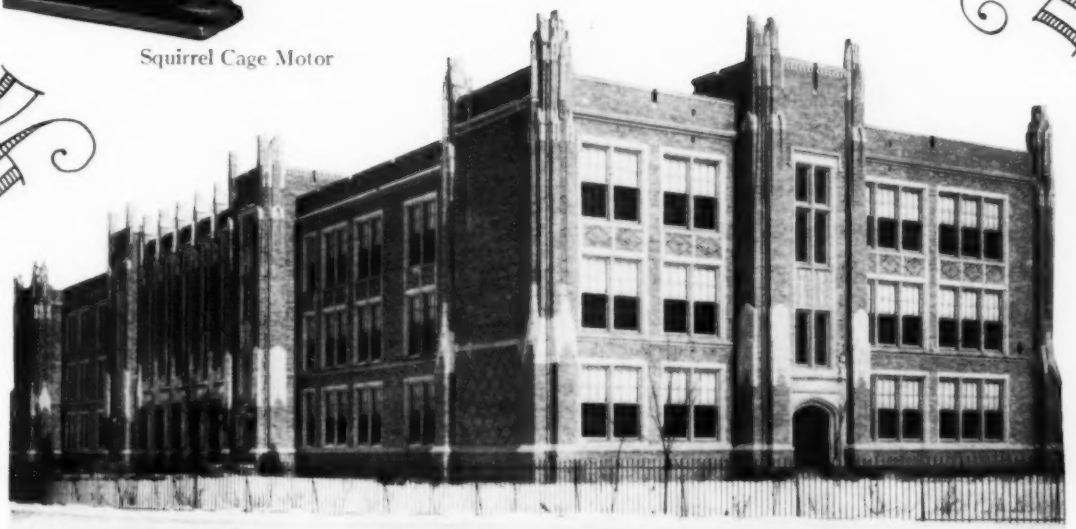

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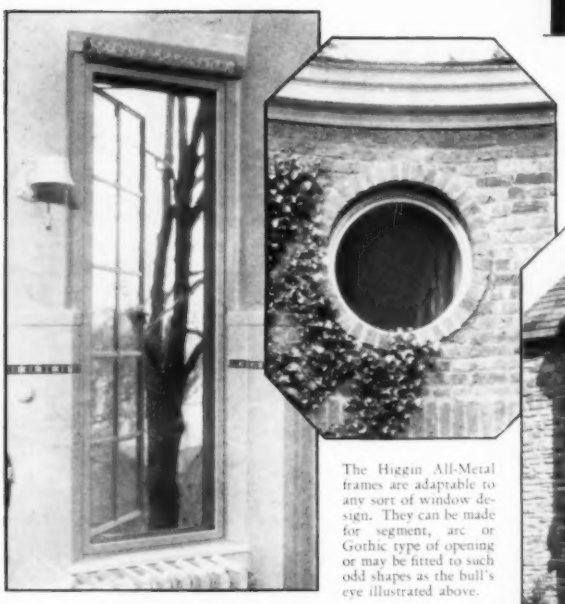

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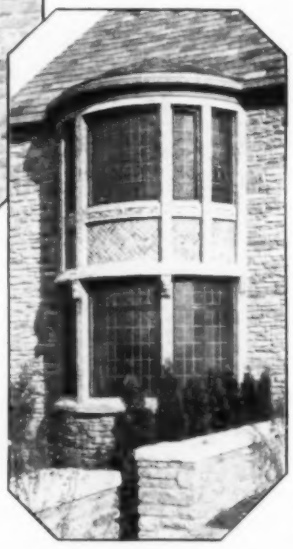

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Operating through the A. D. T. Central Station, this service keeps a constant check on watchmen's activities at all times and transmits coded fire alarms direct from the church to the fire department.

With a nation-wide organization of protection specialists A. D. T. is prepared to meet your needs. For more detailed information, see our advertisement in Sweet's or write us.

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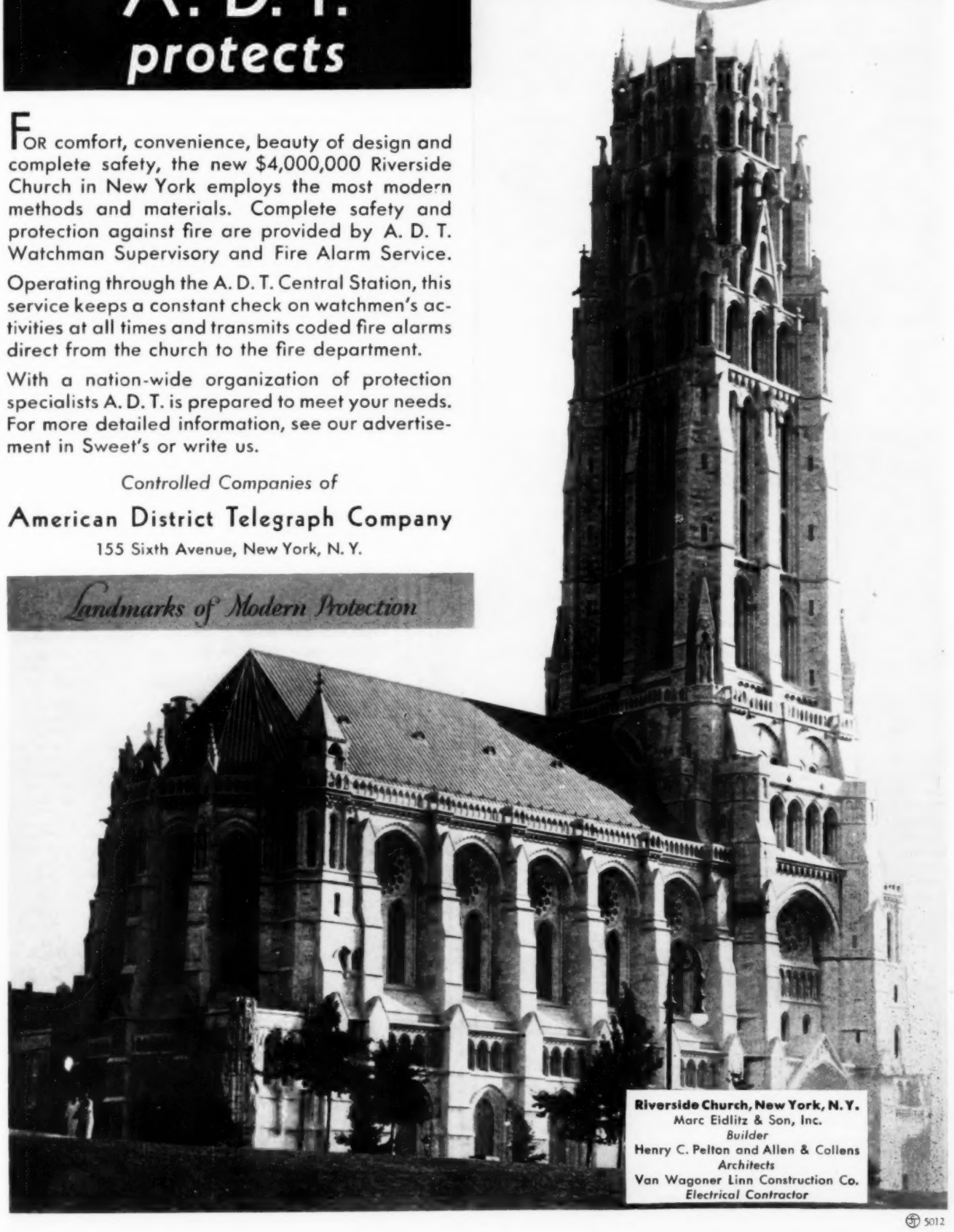

Riverside Church, New York, N. Y.
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Van Wagoner Linn Construction Co.
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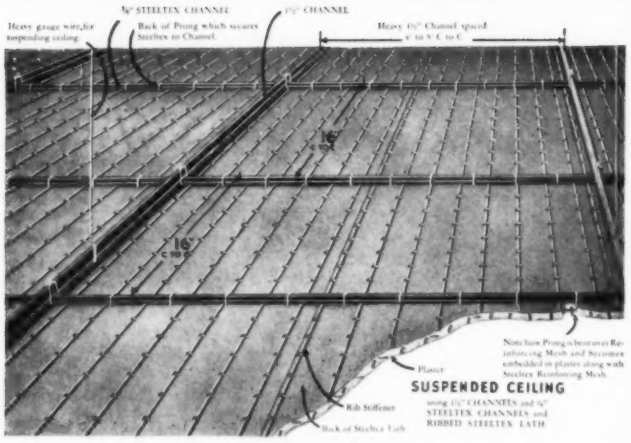
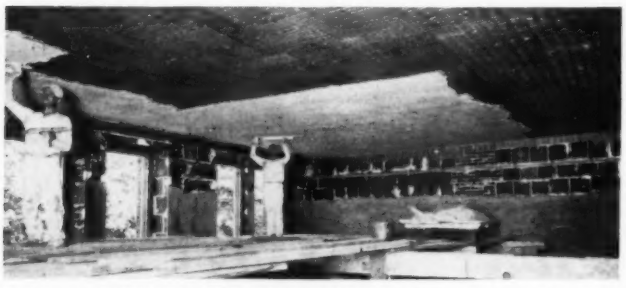
5012

STEELTEX
SUSPENDED CEILINGS


Heavy gauge wire for suspending ceiling
Back of Prong which secures Steeltex to Channel
Heavy 1½" Channel spaced 4' to 5' C. to C.
Plaster
SUSPENDED CEILING
Rib Stiffener
Back of Steeltex Lath

Above: A view looking down on STEELTEX SUSPENDED CEILING construction. The Rib Stiffeners (as shown) give board-like rigidity to Ribbed STEELTEX lath,—are part of Ribbed STEELTEX lath and run lengthwise across the back of every sheet. The galvanized wire fabric on the plaster side of Ribbed STEELTEX lath becomes embedded in the plaster slab as illustrated.



Plastering STEELTEX SUSPENDED CEILING, State Armory, Erie, Pa. Joseph F. Kuntz, Architect, Pittsburgh, Pa. Lee Stearns, Plastering Contractor, Erie, Pa.

The modern way to build suspended ceilings from floor slab, arches, pan system or other similar floor construction is to use the *STEELTEX* SUSPENDED CEILING SYSTEM.

Ribbed *STEELTEX* lath is quickly attached by pushing the lath up against the PRONGS of the *STEELTEX* CHANNEL so that the prongs puncture the fibrous backing of Ribbed *STEELTEX* lath . . . the prongs are then bent over the reinforcing mesh of Ribbed *STEELTEX* lath and pressed in firmly. The plaster is applied over Ribbed *STEELTEX* lath in the regular way (see above). The final result is a solid, steel-reinforced plaster slab with sound-deadening,—crack resisting,—and insulating qualities,—plus freedom from lath and joint marks.

Above: A sheet of Ribbed STEELTEX lath (plaster side showing galvanized reinforcing mesh). The Rib stiffeners run across the back of Ribbed STEELTEX lath and give every sheet its board-like rigidity during plastering.

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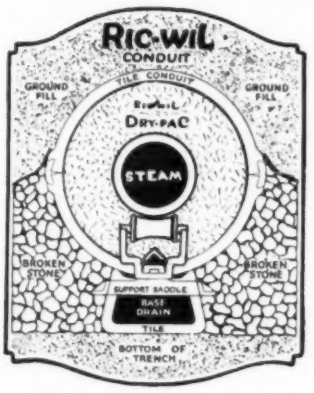

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5. *Cast Iron Ric-wiL to eliminate expensive special concrete construction.*
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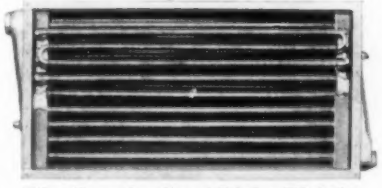

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This firm was selected, without competition, by Birmingham bankers for the Federal Reserve Bank in that city. The School Board selected Warren, Knight and Davis to build all of the three and a half million dollars worth of Birmingham schools authorized in the last bond issue. The state of Alabama selected this office as architects for several buildings for each of the six normal schools in different parts of the commonwealth.

Mr. Warren graduated from Alabama Polytechnic Institute and later from Columbia University. For five years he was in the offices of McKim, Mead & White.

Mr. Knight was trained in several of the larger architects' offices in New York and elsewhere, and also in the Beaux Arts Institute of Design.

Mr. Davis graduated in architecture at Alabama Polytechnic Institute and enjoyed wide experience in the offices of leading Philadelphia and Detroit architects.

Among the notable examples of work done by Warren, Knight and Davis, the following may be mentioned: Alabama Power Company building, Watts building, Protective Life building, Southern Life & Health Insurance building, Jemison Company building, Federal Reserve Bank and Independent Presbyterian Church, all in Birmingham. Engineering, Animal Husbandry, Chemistry and other buildings, at Auburn, for Alabama Polytechnic Institute. Chemistry, Educational and Women's Gymnasium buildings, University of Alabama. Library, Music, Science, Auditorium, Dining Hall, Dormitories and other buildings, Alabama College, Montevallo, Ala.

Left—Watts Building, Birmingham, a recent commission executed by Warren, Knight and Davis. The Birmingham offices of the F. W. Dodge Corporation and the Dodge Plan Room are in this building. Below—Birmingham Branch of the Federal Reserve Bank of Atlanta, designed by the same architects

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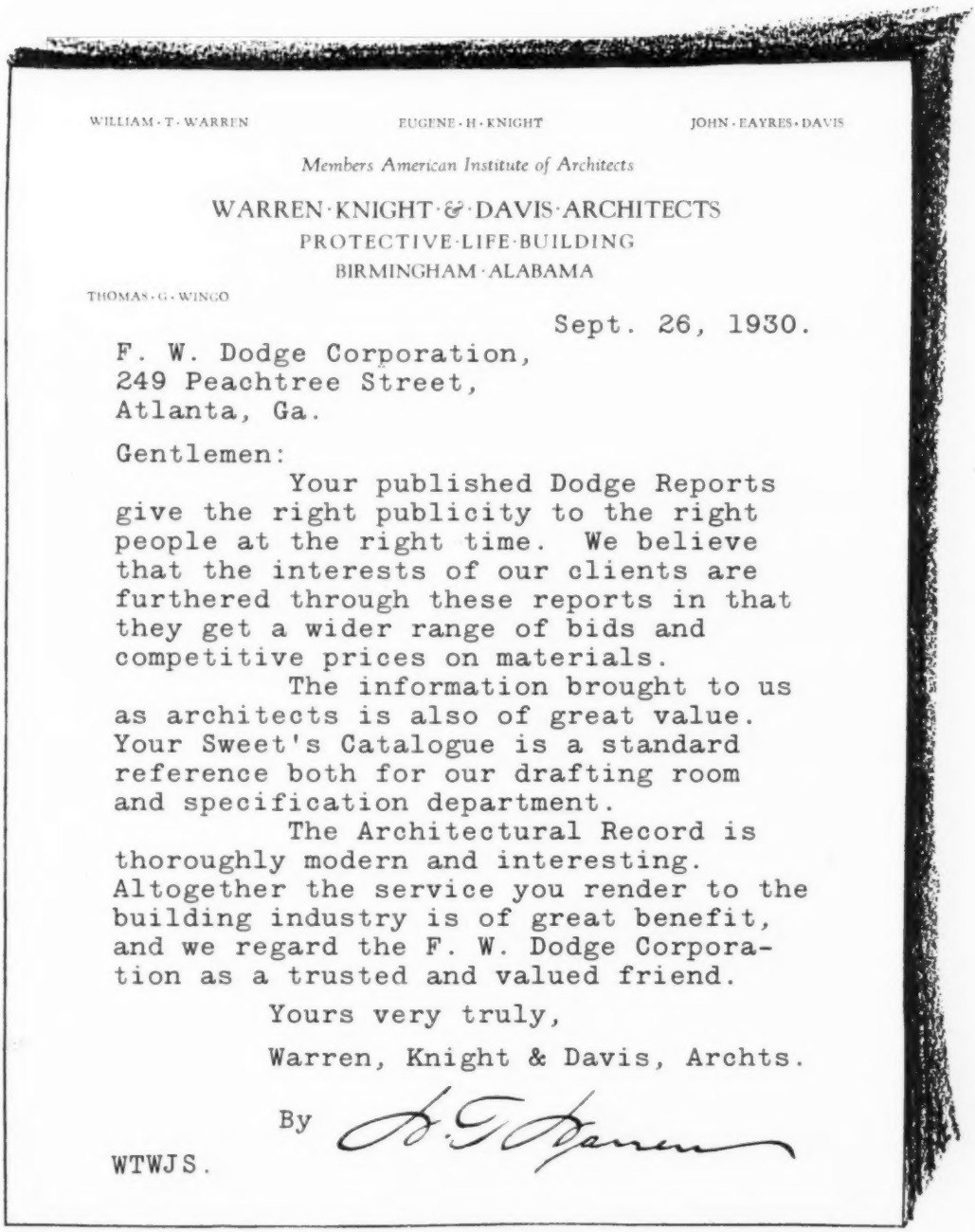

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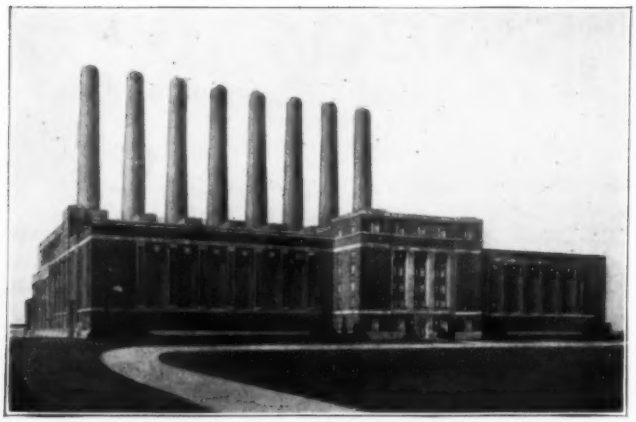

Cleveland Electric Illuminating Company Plant, Ashtabula, Ohio
Architects: Dickerson & Rhoads, Cleveland

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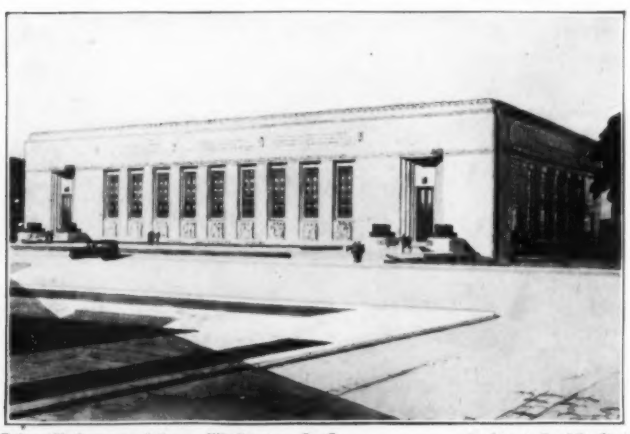

Folger Shakespeare Library, Washington, D. C. Architect: Paul P. Cret

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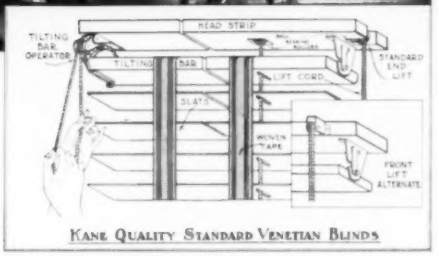

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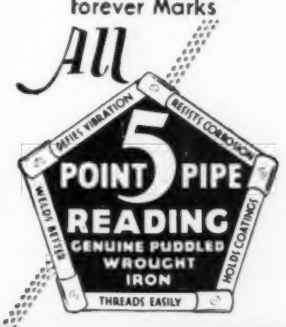

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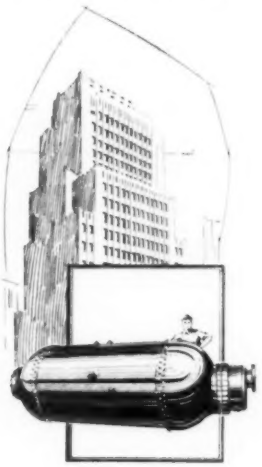

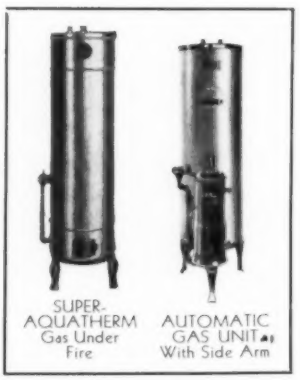

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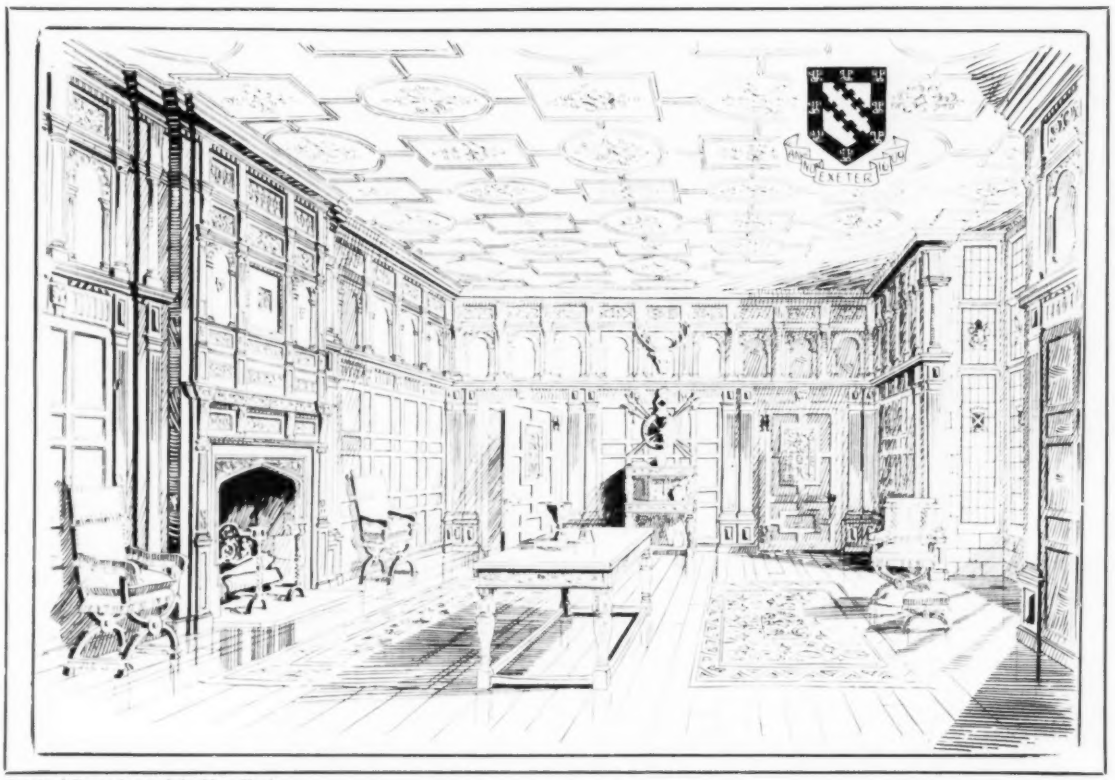

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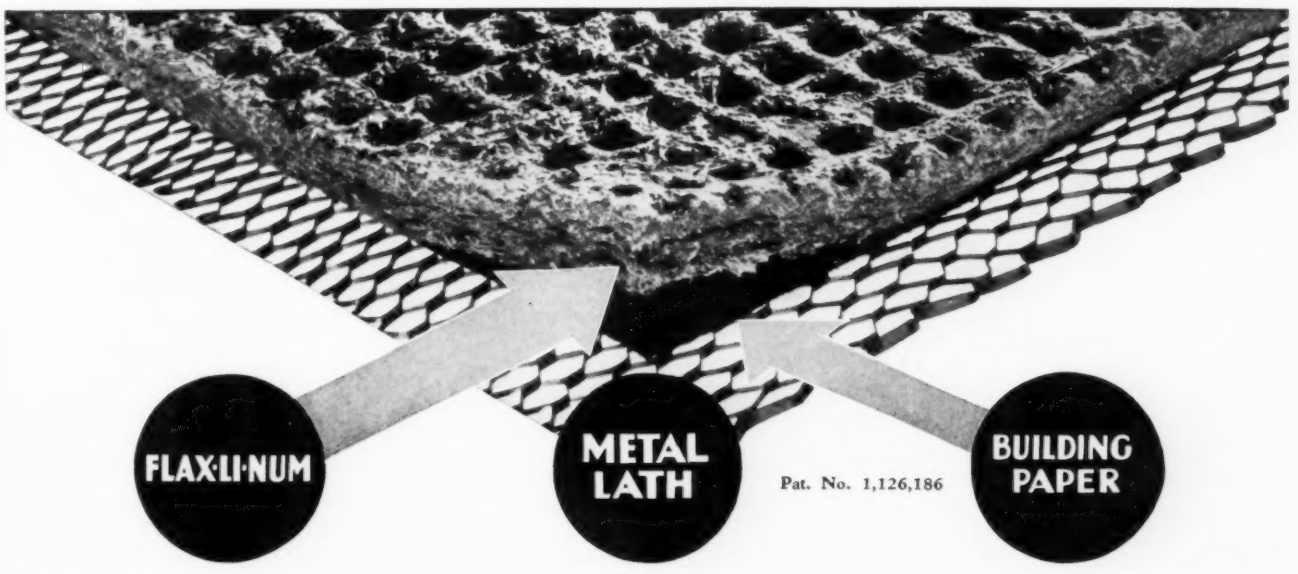

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3,200 United Hollow Metal Doors
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NOWHERE on earth is the ultra-modern in building materials so widely employed as in the monumental structures of greater Manhattan. To be selected for one of New York's cloud piercing business buildings is a warrant of quality and efficiency for any product.

We take especial pride in the use of United Hollow Metal interior trim in the great Bank of Manhattan Building. The New York structures in which United products have been used would make a city in themselves—a monument to United quality.

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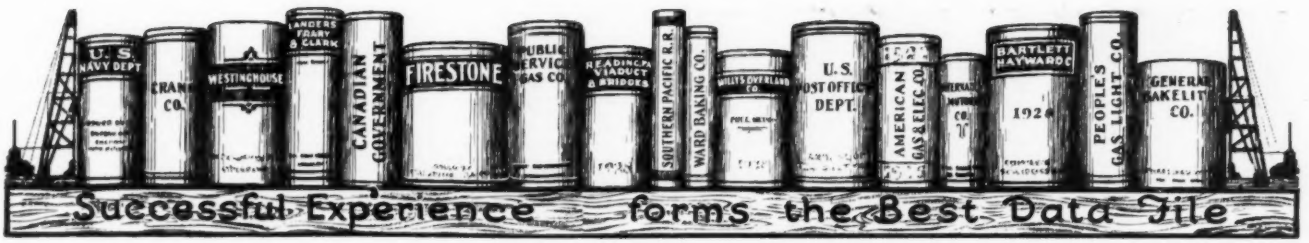

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(A) (B)

(A) Completed pile, formed by compressing a workable, dry mix concrete under 7 tons pressure. This forces dense concrete into intimate contact with surrounding soil, giving the maximum skin friction. Shading shows relative compression of soil due to driving and compression.

(B) Pile in process of being driven. Steel shell and core displacing and compacting surrounding soil.

Showing line of flow of soil. Soil displaced by pile in process of being driven follows the line of least resistance, which is away from the densely compacted soil surrounding the finished pile.

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This is not a plea for more tough jobs, but *when* you have one remember that age has not hardened our arteries. Our advice is unbiased, because we drive, and have driven, every type of pile, in every sort of soil, in every section of the country. The value of our piles and of our service are attested to by the prominent architects and engineers who specify "MacArthur." It is possible that we can serve you also, to our mutual advantage. We will appreciate the opportunity of demonstrating the value of our experience. Send for us when next you have a job requiring piles.

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Product . . proven	Resources . unlimited	Engineering . . sound
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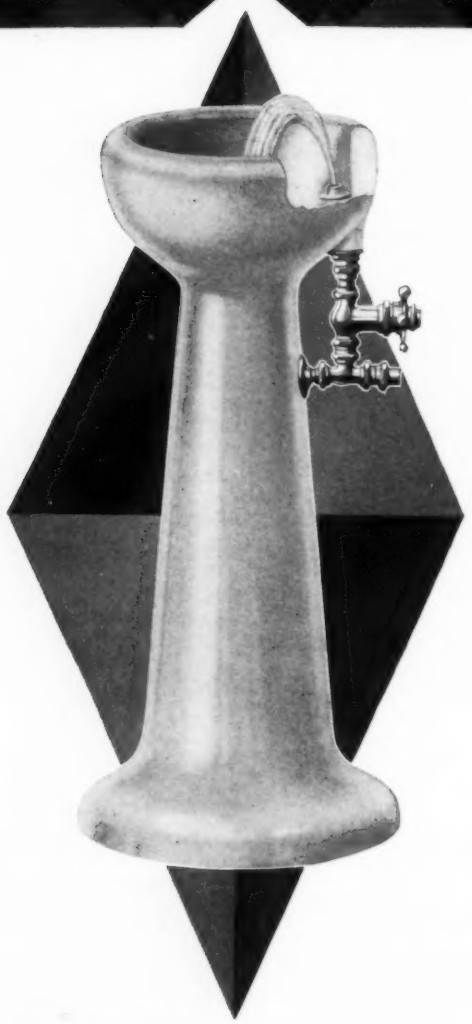
Giles Drilling Corporation (an affiliated company) will welcome the opportunity to submit estimates on core borings or soundings of any description.



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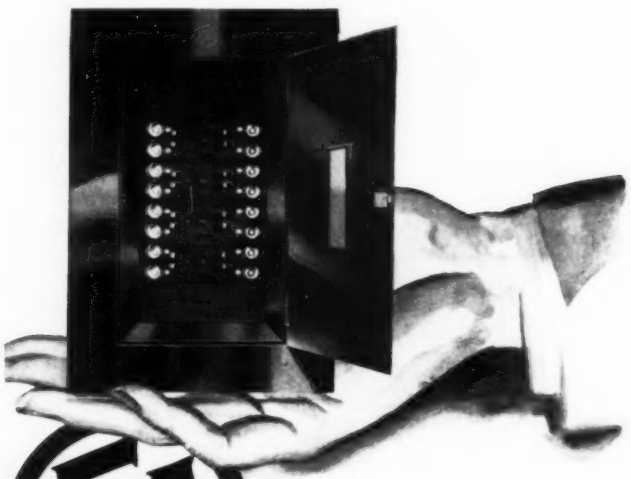

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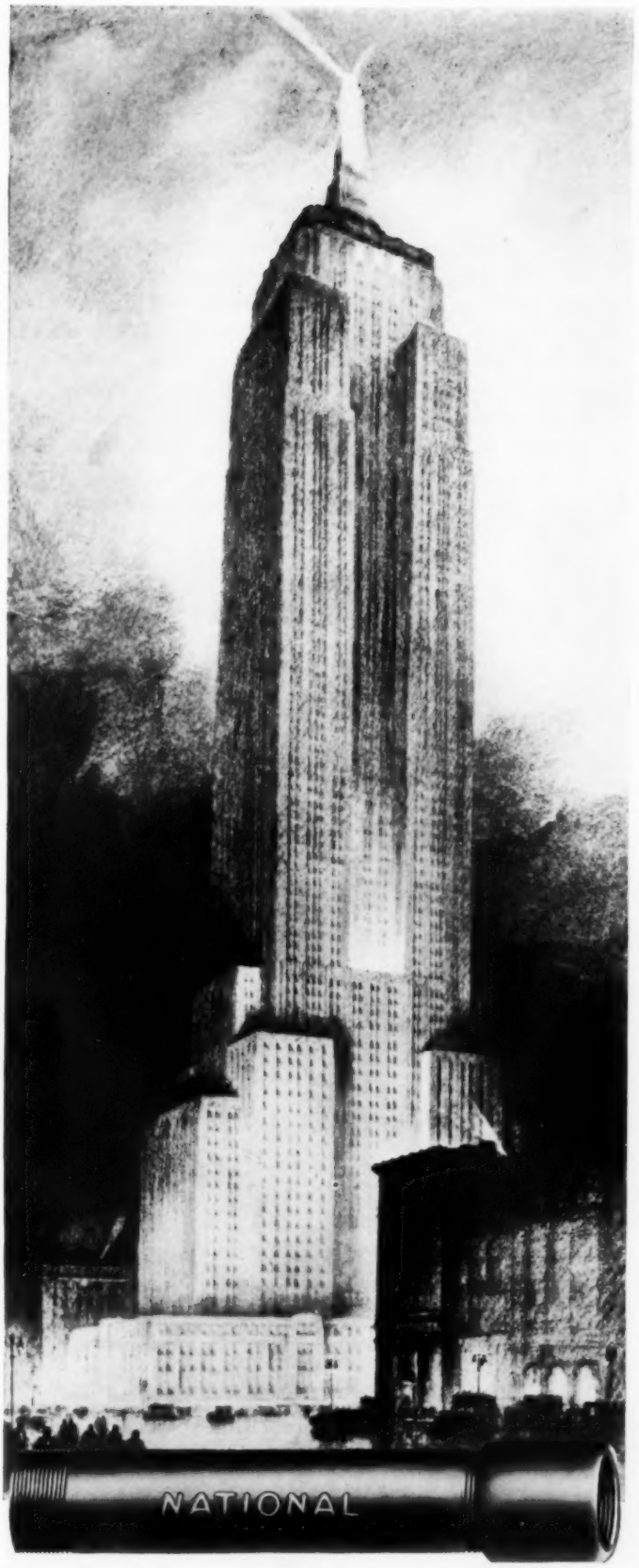

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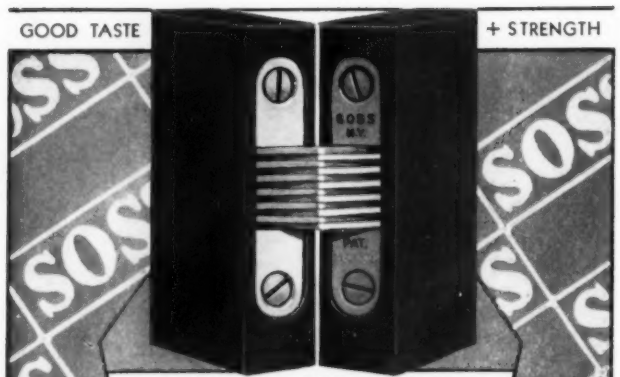

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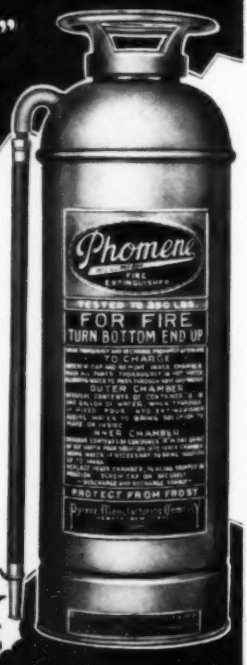

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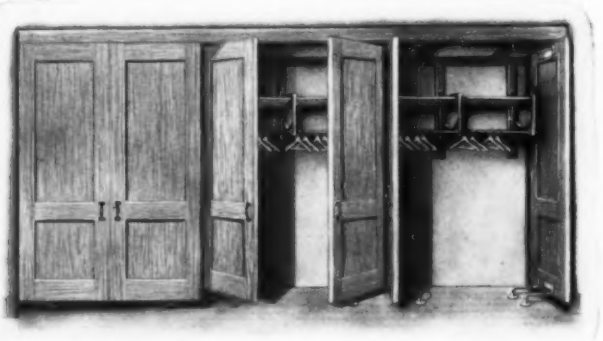

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from

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MERRY CHRISTMAS AND A
HAPPY, PROSPEROUS
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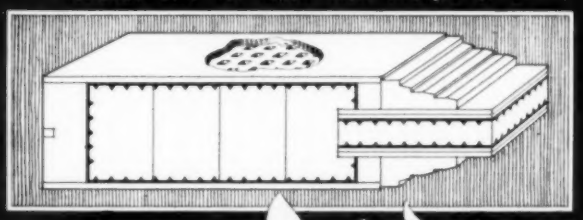
FIRE RETARDING
WOOD DOORS
The insulation does not impair their strength or beauty



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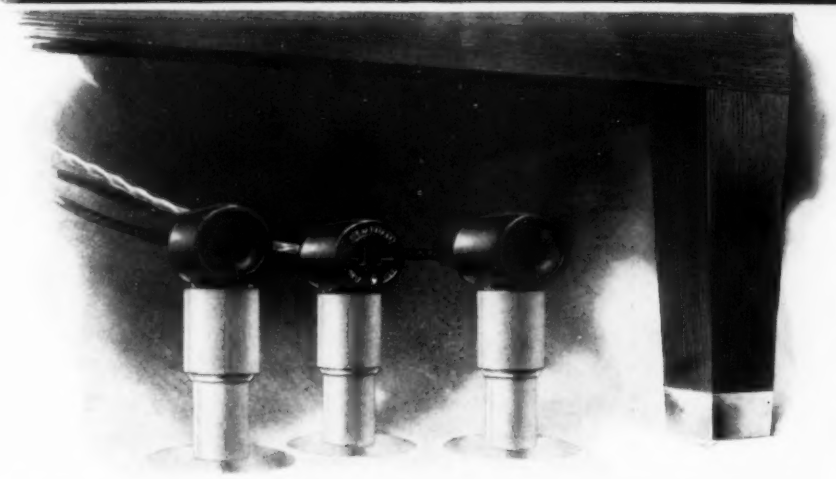

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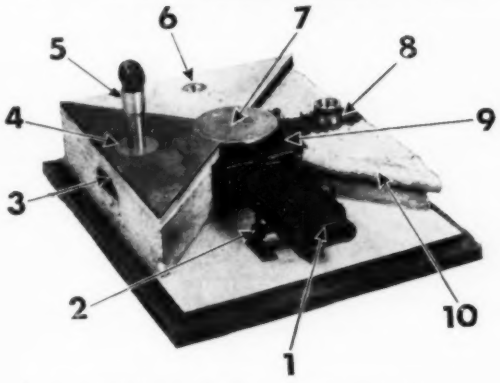

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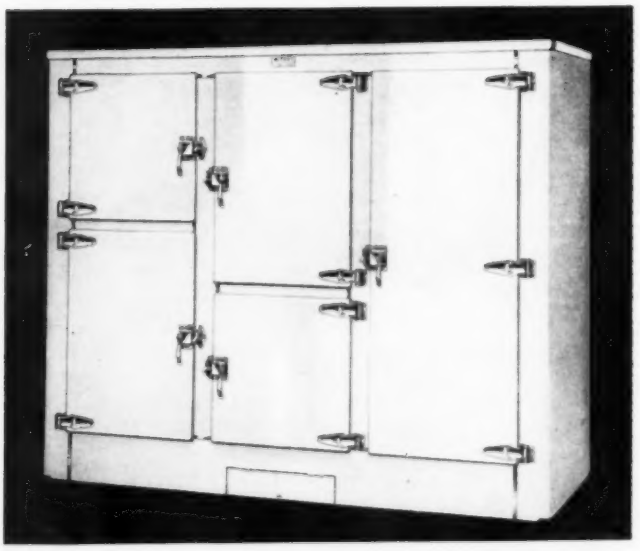

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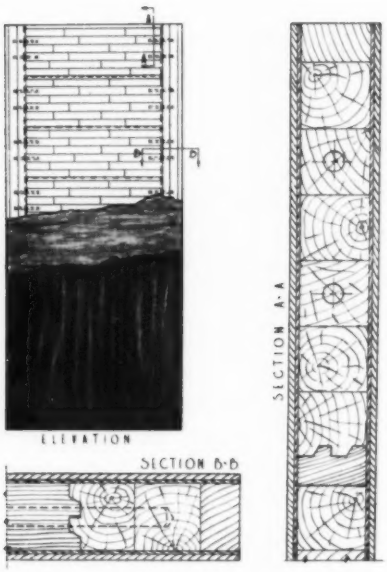

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THE ARCHITECTURAL RECORD
119 West 40th Street
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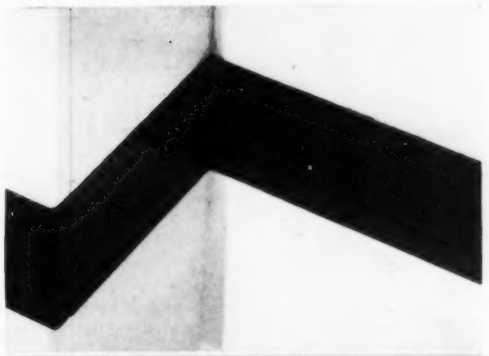

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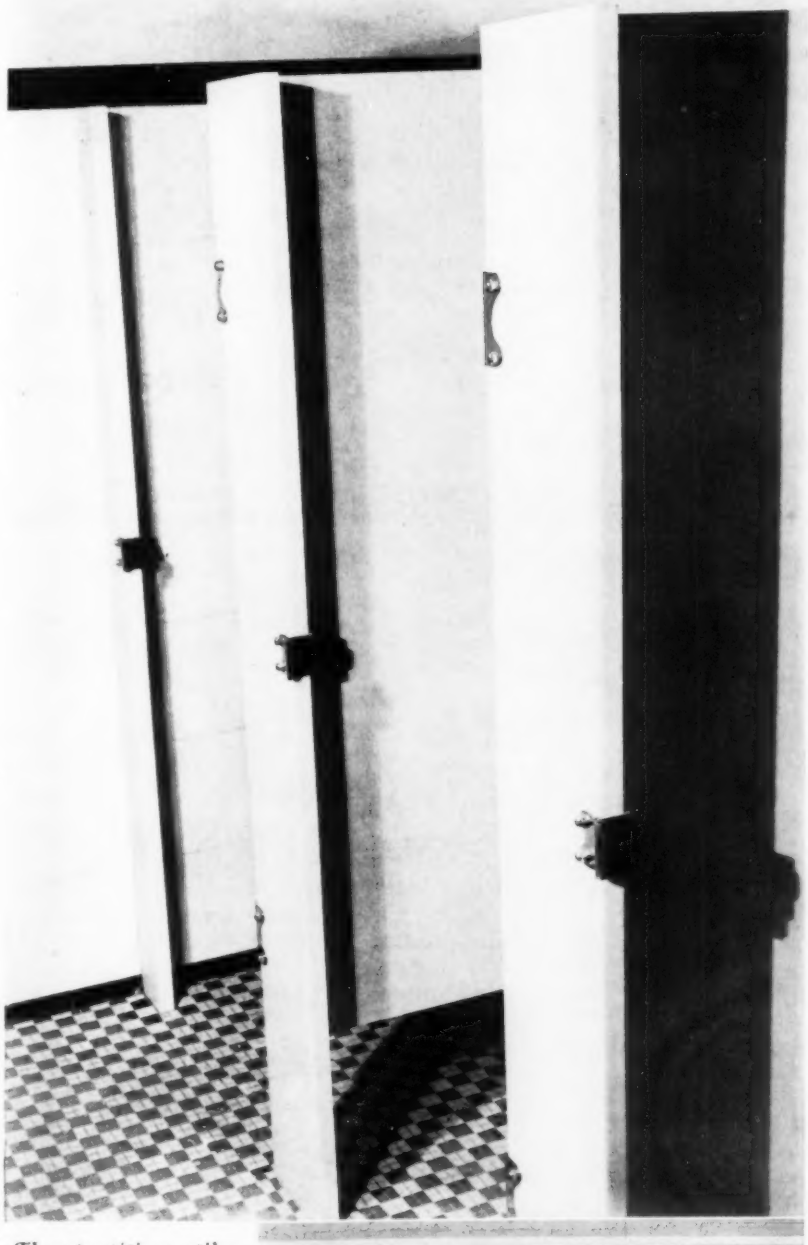

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Modern Structural Glass

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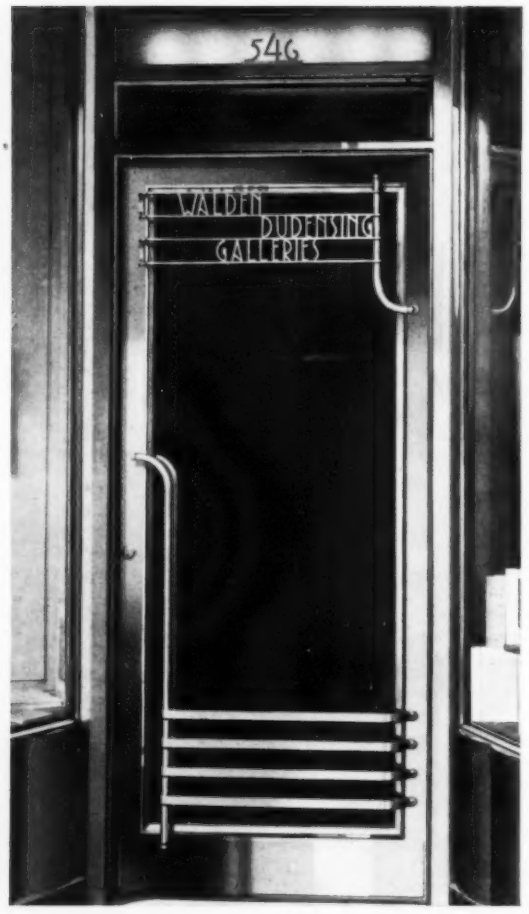
DOORS



OF RUSTLESS METAL

The rails and stiles of this door consist of heavy tubular members, the joints of which are strongly welded. The inner edge of the frame is trimmed with shapely mouldings used for securing the center panel. With necessary hardware furnished and applied the complete ensemble presents a unit appropriate for the finest commercial buildings. Furnished in Bronze or Aluminum Alloy.

Send for complete description and F.S. details.

THE
Kawneer
COMPANY

Niles, Michigan Subsidiary: Berkeley, Calif.

CLASSIFIED DIRECTORY OF ADVERTISERS

Alphabetical Index to Advertisers, Page 158

After reviewing advertisements in this issue—consult Sweet's Architectural Catalogues for 1931 for up-to-date catalogues and specifications on the products of most of the manufacturers.

Acid Proof Chemical Stoneware
Knight, Maurice A.

Acoustics
Armstrong Cork & Insulation Co.
Boston Acoustical Eng. Division of Housing Company
Guastavino, R., Co.
Johns-Manville Corp.
U. S. Gypsum Co.

Air Conditioner
American Blower Co.

Aluminum
Aluminium Co. of America
British Aluminium

Architectural Supplies
Higgins, Chas. M., & Co.

Artstone—Rackle, George, & Sons Co.

Asbestos—Johns-Manville Corporation

Basement, Windows—Steel
Detroit Steel Products Co.
Kalman Steel Co.
Truscon Steel Company

Bathroom Accessories
Parker Charles Company

Beads—Corner Metal
Kalman Steel Co.
Milcor Steel Co.
Truscon Steel Company

Beams, Angles, Channels, Etc.
Bethlehem Steel Co.
Carnegie Steel Company
Jones & Laughlin Steel Corp.

Belts—Dayton Rubber Mfg. Co.

Blackboards—Weber Costello Co.

Boilers—American Gas Products Co.
American Radiator Co.
Dahlquist Mfg. Co.
Heggie-Simplex Boiler Co.
Pierce, Butler & Pierce Mfg. Co.
Smith, H. B., Company, The, Inc.
Wood Gar Engineering Co.

Bolts—Door—Corbin, P. & F.

Brass and Bronze
See "Ornamental Metal"

Brick—Finzer Bros. Clay Co.

Bridges—Steel—American Bridge Co.
Bethlehem Steel Co.

Building Paper
Angier Corporation
National Steel Fabric Co.

Buildings—Steel
Carnegie Steel Company

Butts—Corbin, P. & F.
Stanley Works

Cabinet Work—Hyde-Murphy Co.

Cabinets—Kitchen
Olean Metal Cabinet Works, Inc.

Cabinets—Medicine—Parker Charles Company

Cabinets—Toilet Paper
Victoria Paper Mills Co.

Casement Operators—Rixson, Oscar C., Company

Casements—Bayley, William, Co.
Crittall Casement Window Co.
Detroit Steel Products Co.
International Casement Co.
Mesker Bros. Iron Company
Michaels Art Bronze Co.
Truscon Steel Company

Cast Stone
Cast Stone Institute

Cellar Drainer
Penberthy Injector Co.

Cement—Louisville Cement Company
Medusa Portland Cement Co.
Portland Cement Association
Universal Atlas Cement Co.

Cement White
Medusa Portland Cement Co.

Chain Sash
Detroit Steel Products Co.
Smith & Egge Mfg. Co.

Chairs—Marble, B. L., Chair Co.

Channels—Carnegie Steel Co.
Concrete Engineering Co.
Jones & Laughlin Steel Corp.
Kalman Steel Co.

Church Memorials
Michaels Art Bronze Co.

Clamps—Lock Joint
Hyde-Murphy Co.

Cleaning Systems
Spencer Turbine Co.

Clocks, Electric
Landis Eng. & Mfg. Co.

Columns, Porches, Etc.
Hartmann-Sanders Co.
Union Metal Mfg. Co.

Concrete Accelerator
Master Builders Co.
Solvay Sales Corp.

Concrete Construction—Reinforced
American Steel & Wire Company
Concrete Engineering Co.
Kalman Steel Co.
Truscon Steel Company

Concrete Hardener
Master Builders Co.
Sonneborn, L., Sons, Incorporated
Solvay Sales Corp.

Concrete Surface Treatment
Master Builders Co.
Solvay Sales Corp.

Conduit for Underground Heating Pipes
Ric-wiL Company

Conduits
Fibre Conduit Co.
Fretz-Moon Tube Co.
Garland Mfg. Co.

Cork Tile Flooring
Armstrong Cork Company, Floor Division
Congoleum-Nairn, Inc.

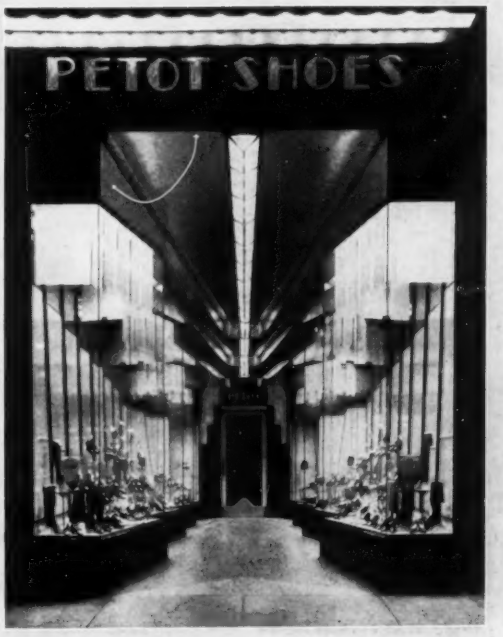
Corkboard
Armstrong Cork & Insulation Co.

Covering—Pipe and Boiler
Armstrong Cork & Insulation Co.
Johns-Manville Corporation
Ric-wiL Company

Door Closers—Corbin, P. & F.
Sargent & Company

Door and Window Frames
Andersen Frame Corp.

STORE FRONTS



Through years of experience, Kawneer craftsmen have acquired the art of rendering in metal (cast, drawn and extruded) distinctive and efficient store fronts of any size or design. Write for book of outstanding installations.

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STORE FRONTS

THE KAWNEER COMPANY, NILES, MICHIGAN
KAWNEER MFG. CO., BERKELEY, CALIF. (SUBSIDIARY)
Manufacturers of
RUSTLESS METAL STORE FRONTS, WINDOWS and DOORS

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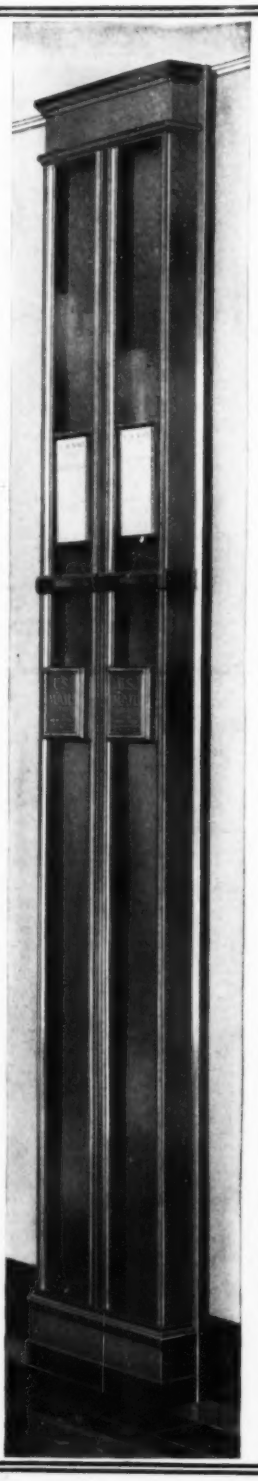
FOR BUILDINGS where large quantities of mail originate, two or more mail chutes are provided, usually installed in pairs. By opening the chutes on alternate floors, danger of over-crowding is avoided, and in case of need one chute can be cleared, cleaned, or repaired, while the service is maintained by the other without interruption.

FULL DETAILS, specifications and information on request.



THE CUTLER MAIL CHUTE CO.
GENERAL OFFICES AND FACTORY
ROCHESTER, NEW YORK

Doors—Baley, William, Company
Compound & Pyrono Door Co.
Dahlstrom Metallic Door Co.
Detroit Steel Products Co.
Hyde-Murphy Co.
International Casement Co.
Kalman Steel Co.
Kawneer Company
Kinnear Mfg. Co.
Michaels Art Bronze Co.
Peelle Company, The
Roddis Lumber & Veneer Co.
Sanymetal Products Co.
Security Fire Door Co.
Thorp Fire Proof Door Company
United Metal Products Co.
Weis, Henry, Mfg. Co.
Wilson, J. G., Corp.
Zouri Co., The

Drains—Josam Mfg. Co.

Drawing Inks—Higgins, Chas. M , & Co

Drives—**Cog Belt**
Dayton Rubber & Mfg. Co.

Electric Switches
Hart & Hegeman Mfg. Co.

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Adam, Frank, Electric Co.
American District Tel. Co.
Bryant Electric Company
Connecticut Tel. & Elec. Corp.
Fibre Conduit Co.
General Electric Company
Graybar Electric Co.
Hart & Hegeman Mfg. Co.
Holtzer-Cabot Electric Co.
Imperial Electric Co.
National Electric Light Association
Westinghouse Electric & Mfg. Co.

Elevator Cars—Tyler Company

Elevator Doors
Michaels Art Bronze Co.
Peelle Company, The
Security Fire Door Co.
Tyler Company
United Metal Products Co.

Elevator Inclosures
Tyler Company
United Metal Products Co.

Elevators
Otis Elevator Company
Westinghouse Electric Elevator Co.

Enamels
Du Pont de Nemours, E. I., & Co., Inc.
Pratt & Lambert, Inc.
U.S. Gutta Percha Paint Co.

Expanded Casings—Milcor Steel Co.

Expanded Metal
Truscon Steel Company

Fence Post—Steel
American Steel & Wire Co.

Fence—Woven Wood
DuBois Fence & Garden Co., Inc.
Reeves, Robert C., Co.

Fences—American Steel & Wire Co.
Fiske, J. W., Iron Works

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Ohio Hydrate & Supply Co.

Fire Exit Devices
Vonnegut Hardware Company

Fire Extinguishers—Pyrene Mfg. Co.

Fireplace Construction—Covert, H. W., Co.

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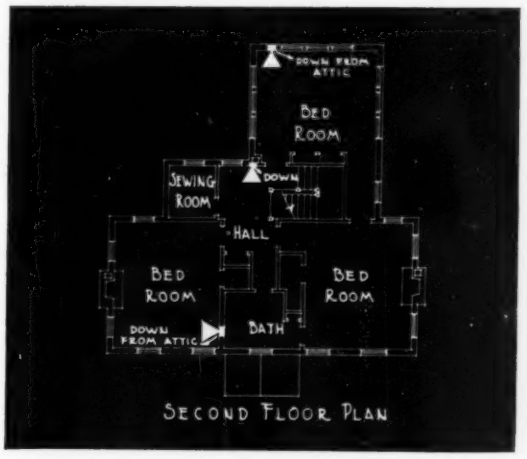
Compound & Pyrono Door Co.
Dahlstrom Metallic Door Co.
Detroit Steel Products Co.
Kawneer Company
Mesker Bros. Iron Company
Peelle Company, The
Thorp Fire Proof Door Company
Truscon Steel Company
United Metal Products Co.

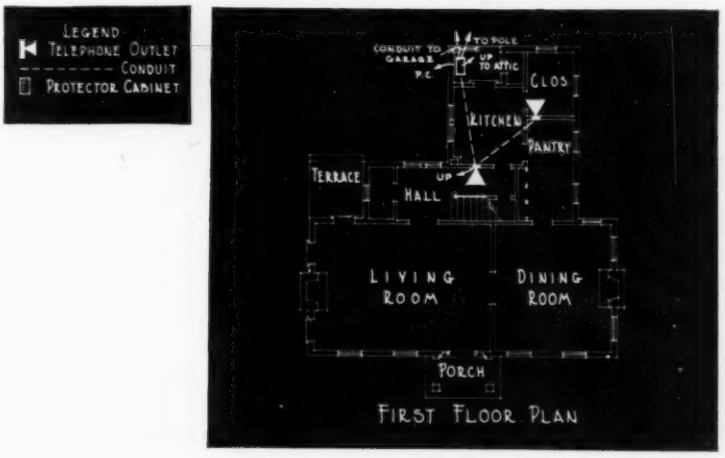
Architects are invited to Consult freely with Bell Company representatives

THE telephone company is constantly studying ways to improve its service. It has much data of interest to architects, particularly in view of the increasing importance of complete *telephone convenience* in the modern home. A call to the Business Office will bring a representative to discuss with you and your clients any questions that may arise in planning for the telephone arrangements in new and remodeled residences.

An important feature of this telephone convenience is the building in of conduit and outlets within the walls and floors during construction or remodeling. This gives improved appearance, by concealing the telephone wiring, and affords protection against certain types of service interruptions. Telephone outlets should be provided in all the important parts of the house. The home owner can then utilize just those which best meet his immediate needs, and he can readily rearrange or expand the service in the future.



Modern telephone convenience is provided for in the residence of Mr. Tom C. Gooch, 3724 Armstrong Avenue, Dallas, Texas, by six telephone outlets, including one in the garage. LANG & WITCHELL, Architects, *Dallas.*



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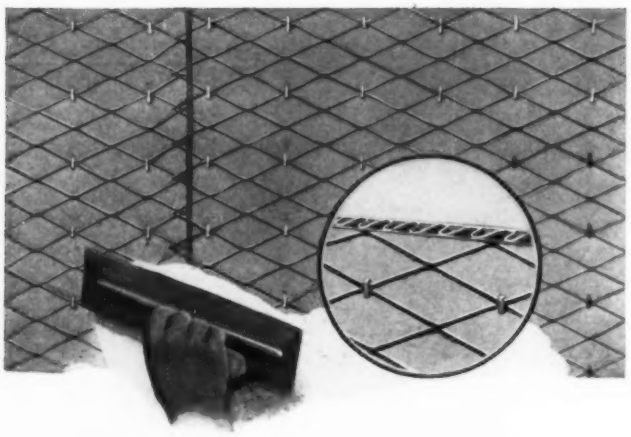

INSULMESH

Insulates
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Saves Plaster

Truscon Insulmesh combines in one product the crack prevention and fire-safety of metal lath, the insulating ability and plaster economy of fibre and plaster boards and the low first cost of wood lath.

The steel mesh becomes thoroughly embedded in the plaster, and by overlapping at the joints, affords continuous reinforcing. Exceptional rigidity of sheets makes erection and plastering easy. Large size saves time and labor.

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You'll want to know more about this economical, insulating, steel reinforced, plaster base. It's new and it's better. Samples, catalog and prices will be sent on request.

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World's largest manufacturers of Permanent Building Products

Offices and Warehouses in all Principal Cities

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See "Concrete Construction," "Covering, Pipe and Boiler," "Fireproof Doors, Shutters and Windows," "Lath-Metal."

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Cheney Company

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Structural Gypsum Corp.

Flooring—Composition
Congoleum-Nairn, Inc.

Flooring—Grid
Snead & Company

Floors—Fireproof—Structural Gypsum Corp.

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American Radiator Co.
Dahlquist Mfg. Co.

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Gypsum Partition Tile
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Gypsum Plaster
Structural Gypsum Corp.

Gypsum Slabs
Structural Gypsum Corp.
U. S. Gypsum Co.

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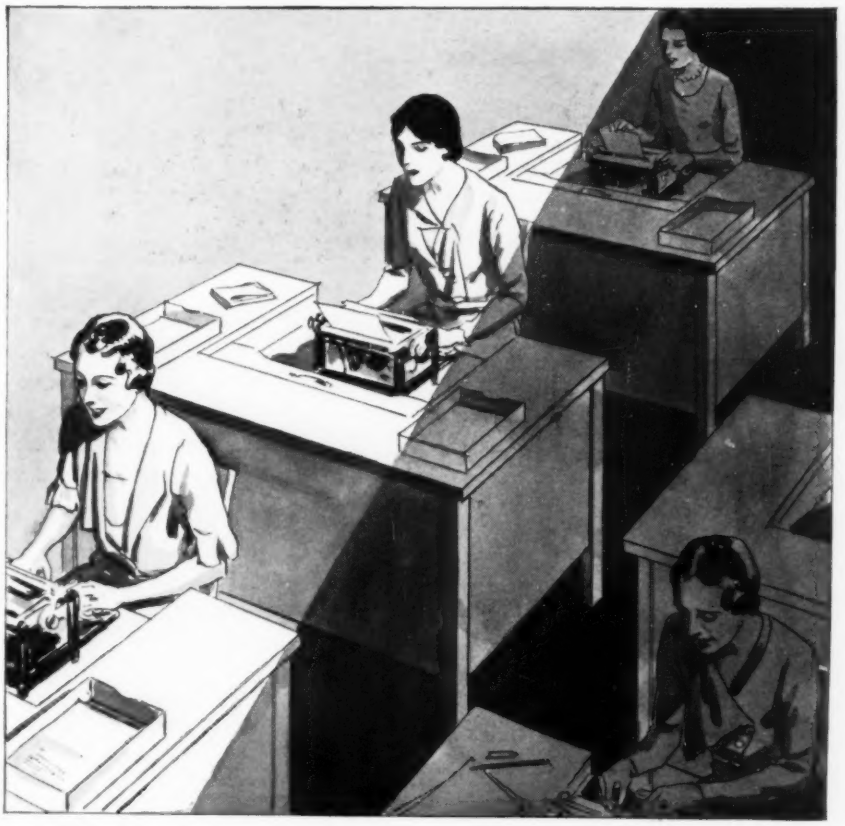
Weis, Henry, Mfg. Co.

Heat Insulation—Johns-Manville Corporation
Ric-wiL Company

Heat Regulator Oven—American Stove Company

Modern lighting keeps your buildings out of the Twilight Zone*



TWILIGHT zone illumination may throw your buildings into the twilight zone of usefulness . . . the twilight zone of profits . . . the twilight zone of owner satisfaction . . . for twilight zone lighting fosters inefficiency. It is so deceiving . . . this partial darkness that retains the hampering qualities of total darkness while it masquerades as helpful light.

Modern standards of lighting adequacy recognize the part light plays in making every building serve its purpose better . . . in making possible the greater appreciation of a building's artistic merits. Keep your buildings out of the twilight zone with modern lighting.

Westinghouse lighting specialists can serve architects and their clients, they help to plan lighting installations that meet today's requirements and make it easy to adopt higher standards in keeping with future lighting progress.

The way out of the Twilight Zone

Architects and engineers who are interested in using light effectively should have a copy of the new, illustrated book, "The Way Out of the Twilight Zone." Address your request to the Westinghouse Lamp Company, Department 203, 150 Broadway, New York, N. Y.

On MAZDA Avenue

In the Westinghouse Lighting Institute actual installations scientifically demonstrate every type of modern lighting —

Open to visitors

Daily 9 to 5 — Saturday 9 to 12
7th Floor, Grand Central Palace, New York City
—around the corner from your hotel

*The deceptive half-light between obvious darkness and adequate illumination.

Westinghouse Lighting Specialists will help you in planning effective lighting installations

Westinghouse

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for the

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THE NEW OFFICES of the Chatham and Phoenix National Bank and Trust Company, New York City are shown above. A conspicuous part of this installation is the B. L. Marble Business Chairs. Many years of practical experience in manufacturing qualifies us to be of unusual assistance to the Architect on seating equipment for banks, courthouses, city halls, and other public and commercial buildings. Drawings and detailed specifications will be submitted without obligation.

Complete Catalog will be mailed on request

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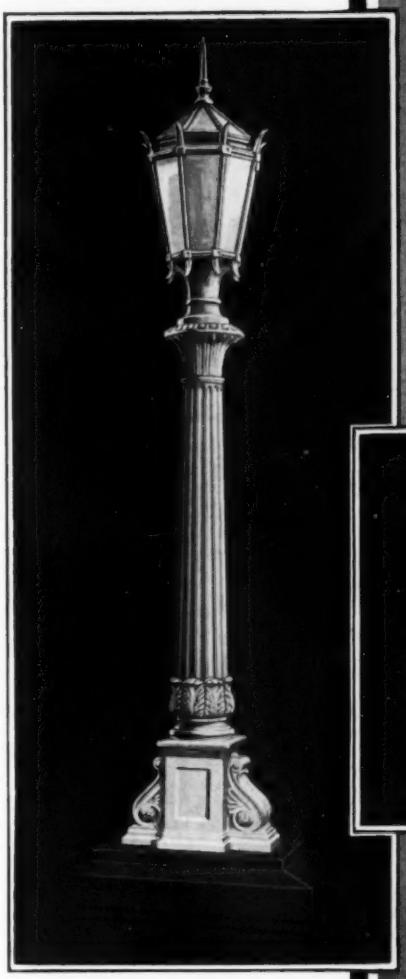

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Standard
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24 Years of Experience

HAVING specialized in the manufacture of lighting equipment for 24 years, Union Metal has been able to develop a complete line of standard brackets, newels, and entrance standards. Designs and styles for almost every type of service are available in either cast iron or bronze.

Where special designs are required, Union Metal offers the services of competent craftsmen and an efficient foundry. A thorough understanding of architectural requirements as well as a technical knowledge of lighting and the equipment to produce fine castings make Union Metal fixtures beautiful and distinctive.

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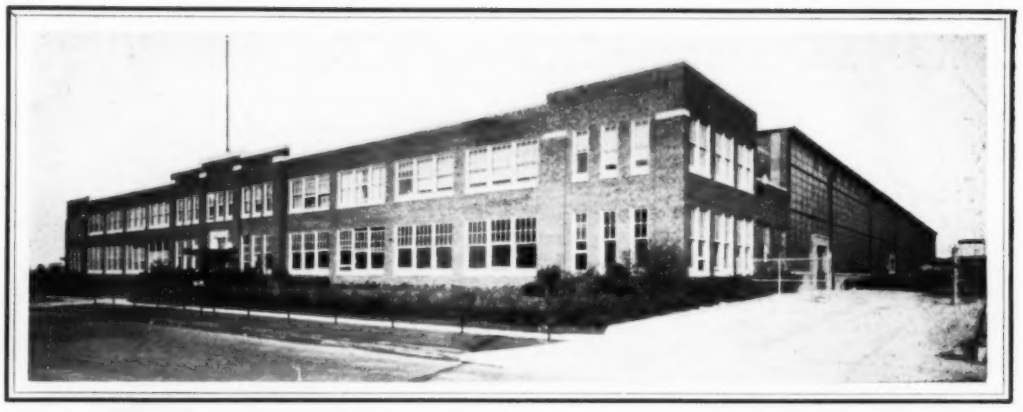
UNION METAL

EXTERIOR

LIGHTING FIXTURES



Plant of the Geometric Stamping Company, at Cleveland, Ohio. The Austin Co., engineers and builders

■

Our catalogue is in Sweet's — Page A 635

IT IS INTERESTING TO NOTE the trend of the day in industrial construction—the increasing attention paid to architectural design and its setting. This is well evidenced above in the use of RACKLE ARTSTONE for the entrance, buttress caps, window sills and coping, as also in the landscaping by means of lawns and shrubbery. Of high quality yet inexpensive, RACKLE ARTSTONE has widely commended itself to architects for construction of all types, from the simple manufacturing plant or store to the most elaborately decorated church building.

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National Steel Fabric Co.

Nirosta Metal—Krupp Nirosta Co., Inc.

Oil Burners
Johnson, S. T., Co.
Wood Gar Engineering Co.

Ornamental Metal
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American Brass Co.
Fiske, J. W., Iron Works
General Bronze Corp.
Michaels Art Bronze Co.
Smyser-Royer Company
Tyler Company

Paints—Aluminum Co. of America
Berry Brothers
Cabot Samuel, Inc.
Du Pont de Nemours, E. I., & Co., Inc.
National Lead Co.
Pittsburgh Plate Glass Co.
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U. S. Gutta Percha Paint Co.

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General Electric Co.
Trumbull Electric Mfg. Co.
Westinghouse Electric & Mfg. Co.

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Wilson, J. G., Corp.

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Sanymetal Products Co.
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Reading Iron Company
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Rundle-Spence Mfg. Co.
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Nash Engineering Company
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Effective color combination of Armstrong's Linotile in Agate, Onyx, Matrix, and Tourmaline specified for floor in E. A. Pearce Co., Seattle, Wash., brokerage office.

Where "BULLS" *battle* "BEARS"

This Armstrong's Linotile Floor comes through without a loss in durability or beauty

IN spite of maddening activity around the quotation board . . . that never ending rush of frenzied feet (relentlessly attacking a floor's true worth) the Armstrong's Linotile Floor in this brokerage house never loses its businesslike dignity.

Here the floor had to resist the toughest kind of wear—continual scuffing, stamping. Yet the battle was won before it started. The architect had specified Armstrong's Linotile! Past experience had proved Linotile's inherent worth.

Armstrong's Linotile Floors quiet heavy footsteps. Add dignity to any setting. Retain their fresh, businesslike appearance. A daily "once over" brushing and an occasional waxing assure their absolute cleanliness.

Furthermore, with a hand-laid Armstrong's Linotile Floor any desired floor effect can be created—any color scheme perfectly matched—architect's individual floor designs carried out. Because Armstrong's Linotile is custom-built, available in thirty different colors and a score of sizes.

Let us tell you more about these modern floors. Our book "Custom-Built Floors of Cork" states facts that will prove valuable as well as interesting. It's free. Just write Armstrong Cork Company, Custom Floors Department, Lancaster, Penna.

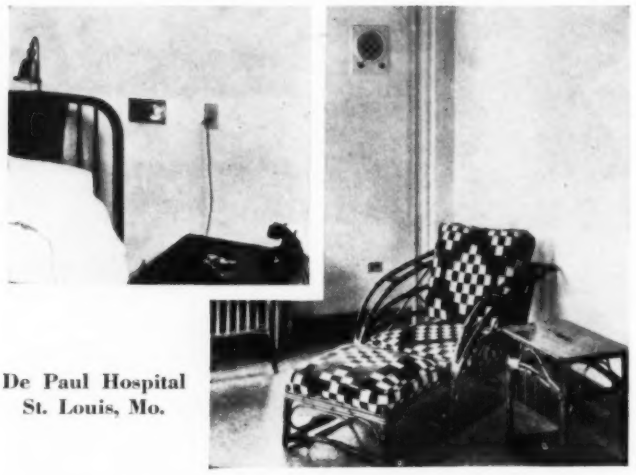
Armstrong's (A) *Product*

Armstrong's CUSTOM FLOORS

LINOTILE **CORK TILE**

MADE BY THE MAKERS OF ARMSTRONG'S LINOLEUM

Convalescents
NEED RADIO
more than anyone else!



De Paul Hospital
St. Louis, Mo.

Hospitals everywhere now taking advantage of the therapeutic value of radio entertainment by installing

RCA *CENTRALIZED* RADIO

EVERY patient in as many as 5,000 rooms can now enjoy radio's finest programs! By merely touching a wall switch, each patient has a choice of as many as four different broadcast programs.

Either radio or phonograph reproduction is available. And reception is as perfect if not better as though individual receiving sets were used in each room.

RCA offers this finest centralized radio equipment at surprisingly low cost. It is extremely simple and economical. Future wiring costs are prevented. Unsightly individual aerials and lead-in connections are completely avoided.

Each hospital installation is designed by RCA engineers to fit that particular job. Although fully standardized, no equipment is ever "adapted." Approved by the National Board of Fire Underwriters.

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Descriptive pamphlets of this system and photographs of typical installations are available to architects, hospital directors and superintendents. Without obligation, we shall gladly prepare plans and estimates for installations of any size.

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Ruberoid Co., The
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Sheldon, F. C., Slate Company

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Wilson, J. G., Corp.

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Safety Tread
Norton Company

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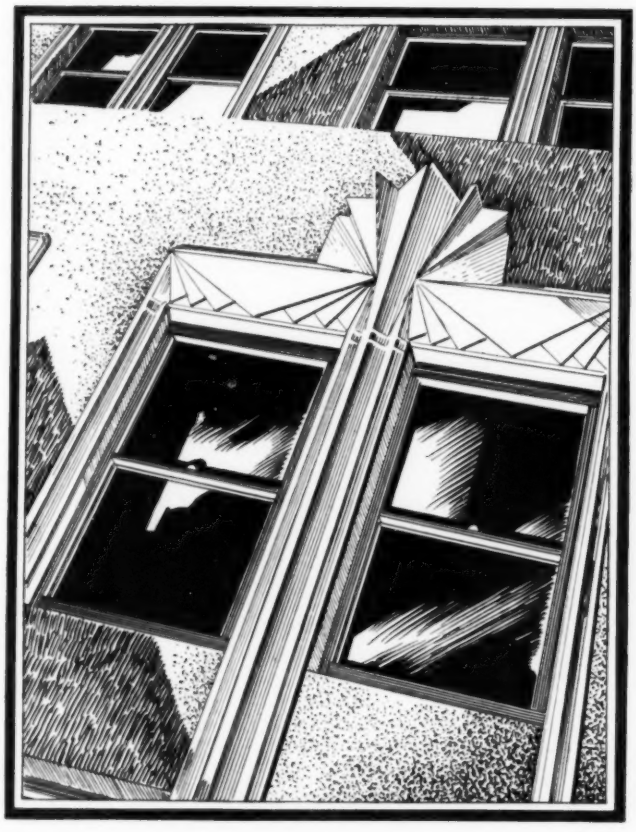

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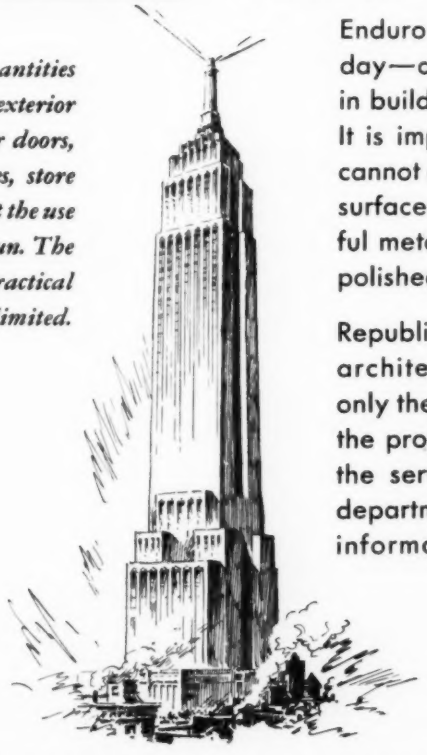

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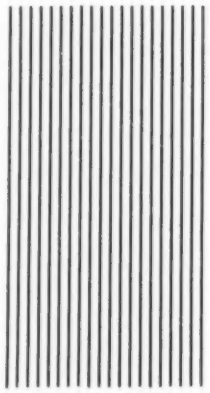

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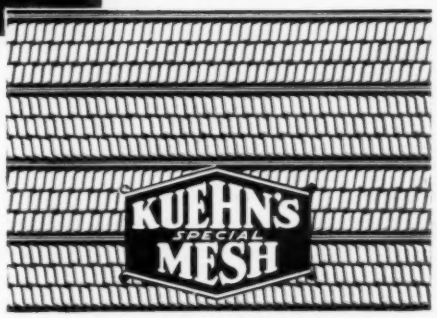

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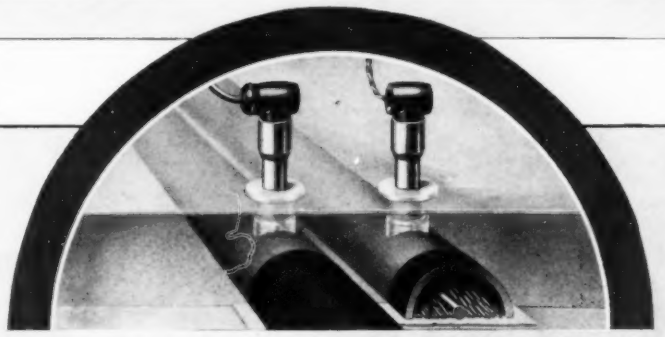

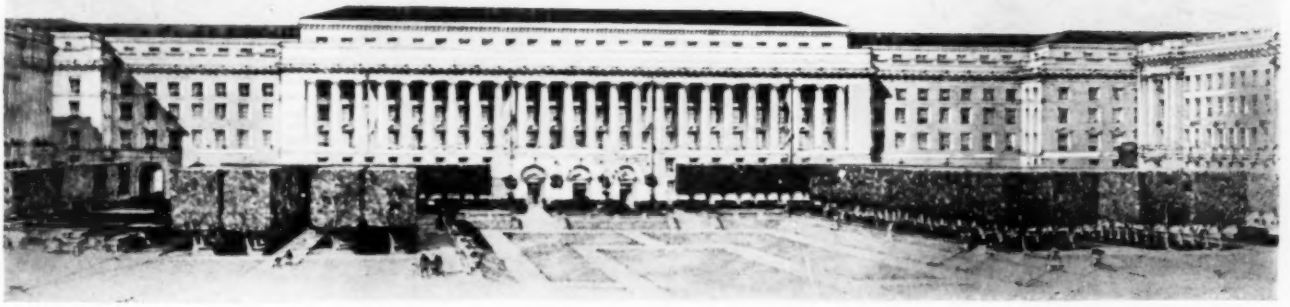

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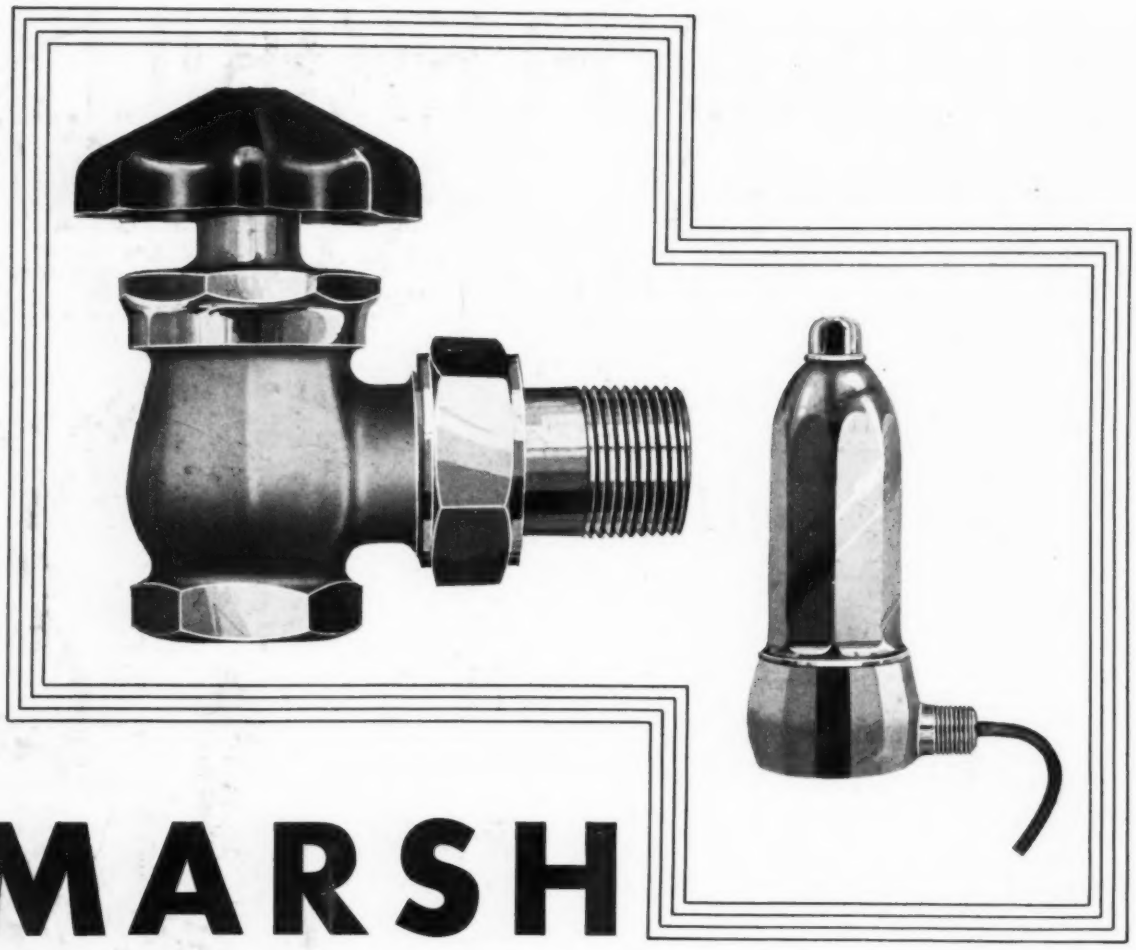

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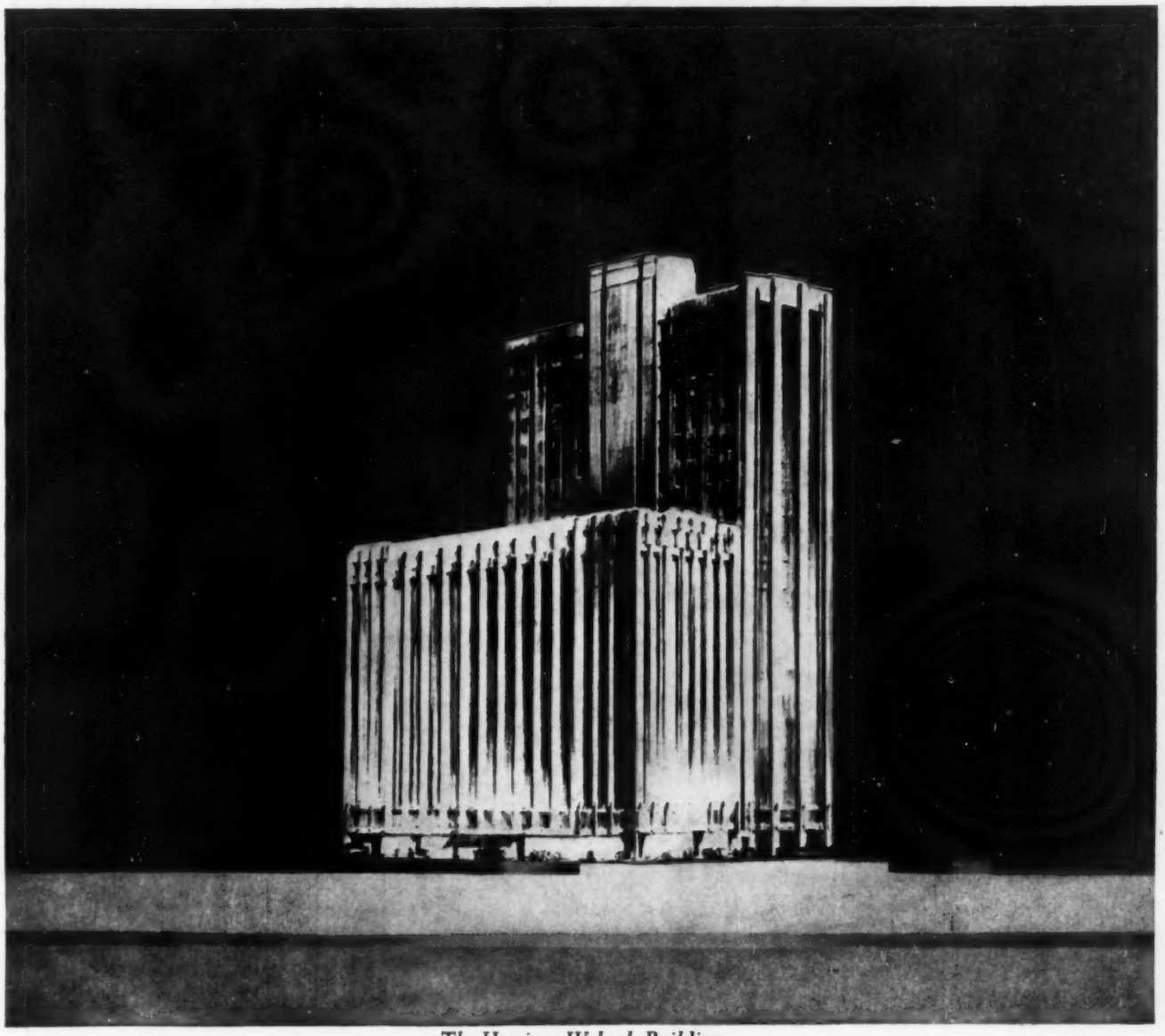

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